

# Journal

## OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

*Joint Pan American-AVMA Meeting, Kansas City, August 23-27, 1959*

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## Rabid Dogs Lose Bout with Police

LEMARS, Ia.—Special: A fierce 10-minute battle between two rabid dogs and two police officers ended safely for the policemen here Monday when they poured a volley of shots into the raging animals.

Two stray shorthaired mongrels, one white and one brown, came running up the road from the south and charged a group of small children playing in the [redacted] home yard in the southeast part of town near Cleveland park.

The frightened, screaming children ran into the Lewis home with the rabid dogs at their heels.

After racing through the upstairs rooms, snarling, barking and foaming at the mouth, the dogs finally dashed into the basement of the house. Meanwhile, Mrs. [redacted] herded the crying children into a bedroom and ran to a neighbor's house to telephone police. She had no phone in her home. [redacted] answered the call. When they opened the basement door slightly, the large brown dog hurtled through the doorway, jumping on top of [redacted]. [redacted] fought off the furious attack, kicking and defending himself as best he could, but could not use his gun.

As the enraged animal pounced upon [redacted] he poured a volley of shots into the dog. The wily mongrel put up no fight but lay on the floor moaning and shrieking and foaming at the mouth. He then shot the other dog. Neither of the men was bitten by the dogs.

Dr. [redacted] veterinarian, examined the dogs and declared them rabid. The bodies were burned. Dr. [redacted] warned farmers and others to be on the lookout for rabid animals as the dogs may

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EDITORIAL STAFF: W. A. Aitken, *Editor Emeritus*; Donald A. Price, *Editor in Chief*; H. E. Kingman, Jr., *Managing Editor*; Eva G. Bailey, *Assistant to the Editors*.

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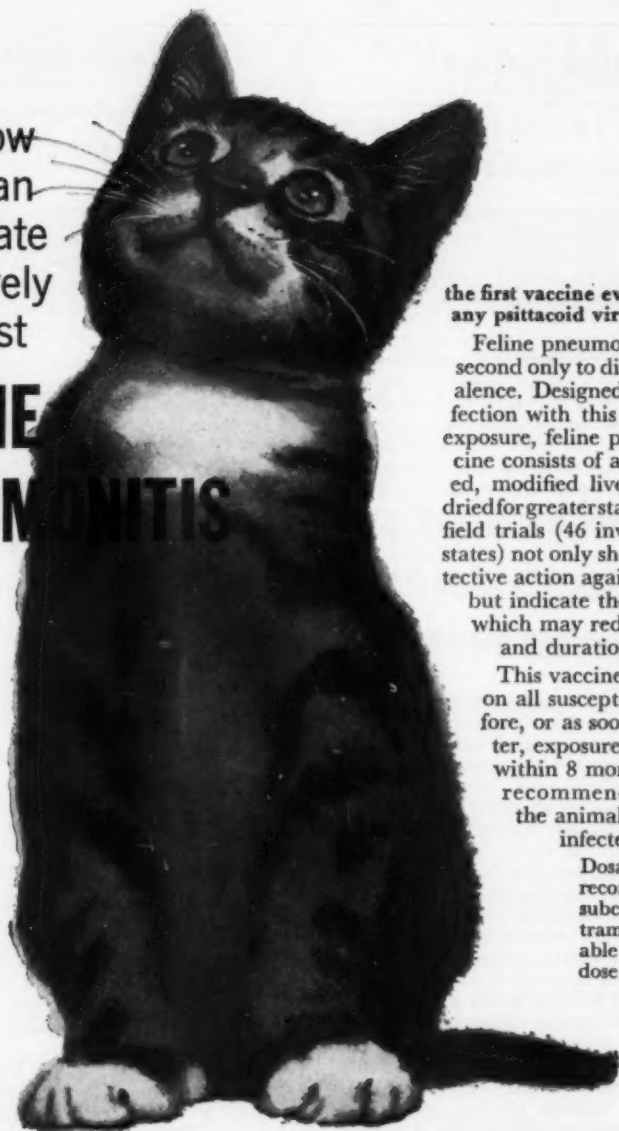
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field use in noninfected cats				field use in infected cats			

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## Correspondence

June 1, 1959

Dear Dr. Aitken:

Recently, two articles have appeared describing the use of the insecticide *Aramite* as a treatment for mange of dogs and of laboratory mice (*JOURNAL*, Feb. 15, 1959: 177-179; and *Am. J. Vet. Res.*, Jan., 1959: 198-200). This compound was originally approved by the Food and Drug Administration for use as an insecticide on edible fruits and vegetables with one part per million maximum tolerance permitted. More recent studies indicated that the compound was apparently capable of producing adenocarcinoma of the gall-bladder when fed to experimental dogs, so all use of the compound on edible foodstuffs was banned (*Fed. Reg.*, 23, Dec. 24, 1958: 10180). In view of this, I believe it is advisable that veterinarians refrain from using the compound until its limitations are better known.

s/WILLIAM E. RIBELIN, D.V.M.  
El Cerrito, Calif.



### Have You Checked Your Social Security Record Lately?

It's good business to check your social security account at least once every three years. The record of earnings kept by the Social Security Administration forms the basis on which eligibility and benefit amounts are determined. An error in your social security account might affect the amount of benefits you or your survivors could receive.

Under the old-age, survivors, and disability insurance system, employers send in periodic reports to the Government showing the wages paid to each employee. Self-employed people report their own earnings as a part of their annual income tax return. The Social Security Administration credits these earnings to the accounts of some 120 million social security card holders. When a worker dies, retires, or becomes severely disabled, the earnings record reflects the length of employment or self-employment and the level of earnings on which eligibility and benefit amounts are figured.

Sometimes the earnings are not properly reported or the social security account number is omitted or wrong. When this happens, the social security bookkeepers cannot credit the earnings to the proper account until the matter is straightened out.

Employees and self-employed people are urged to check on their social security earnings account at least once every three years to assure themselves that the record is correct. The statute of limitations makes it more difficult to correct errors more than three years old. Any social security district office has a handy postcard form that can be used to request a statement of your earnings.

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### Eli Lilly Dedicates Research Center

A new, five million dollar research center at Greenfield, Ind., was dedicated by Eli Lilly and Company on June 16.

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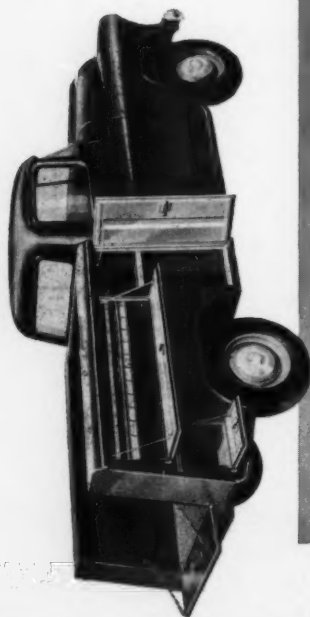
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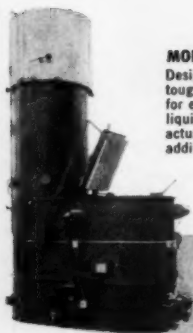


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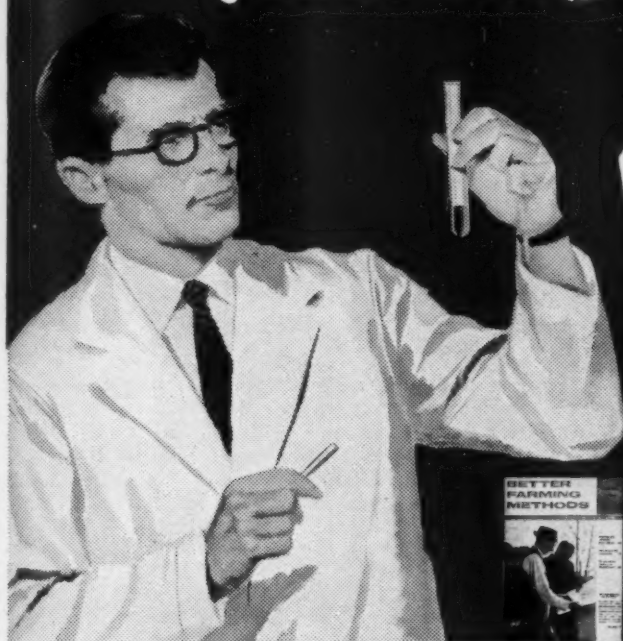
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FROM THE AVMA WASHINGTON OFFICE

**Hearings on Tax  
Deferment for Self-  
Employed**

Senate Finance Committee held hearings June 17-18 relative tax deferment for self-employed (H.R. 10 and S. 1979). Approximately 50 witnesses were scheduled. Due to numerous and serious questions put to Treasury witnesses, Hon. David A. Lindsay and one A.F.L.-C.I.O. witness, only four others heard July 17. Remaining witnesses that day given opportunity to file statement for the record or appear later. AVMA witness, Dr. Jack O. Knowles, chairman Advisory Committee House of Delegates, is among proponents who elected to appear, probably in July.

**Veterinary Drugs Can Not  
Contain Cancer-Inducing  
Agents**

Veterinary drug components cannot contain additives if found to induce cancer when ingested by man or animal, under a new directive by Food and Drug Administration. This will apply if, as a result of its use, residues of the drug or its conversion products become a component of human food derived from the animal.

**AVMA Supports H.R. 7317**

House Agriculture Subcommittee on Livestock held hearings June 25, on H.R. 7317, a companion bill to S. 864 (see JOURNAL, June 15, 1959, adv. p. 12), to provide greater protection against diseases of livestock and poultry. AVMA filed a statement supporting enactment of H.R. 7317.

**Label Declaration for  
Chemical Preservatives**

H.R. 7480, Rep. Ullman (D., Ore.), amend Federal Food, Drug, and Cosmetic Act relative label declaration. Applicable chemical preservatives shall not apply to pesticide chemicals used on raw agricultural commodity which is product of the soil.

**Safe Color Additives**

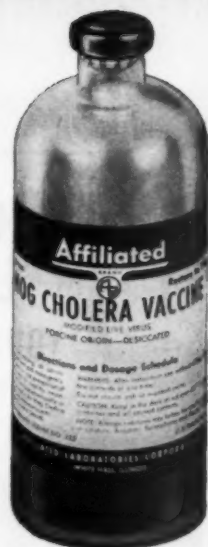
H.R. 7624, Rep. Harris (D., Ark.); S. 2197, Senators Hill (D., Ala.) and Goldwater (R., Ariz.), protect public health by amending Federal Food, Drug, and Cosmetic Act authorizing use of suitable color additives in or on foods, drugs, and cosmetics, under which such additives may be safely used.

**Income Tax Bills**

To amend Internal Revenue Code of 1954, H.R. 7736. Repeal credit provisions allowing tax credit and exclusion from gross income for dividends received by individuals. H.R. 7737, to provide withholding tax at source on interest and dividend. H.R. 7739, to prohibit deductions of certain expenditures as trade or business (companion bill S. 2040, see JOURNAL, July 1, 1959, adv. p. 14), all by Rep. Thompson (D., N.J.).

**School Construction  
Program**

S. 2170, Sen. Neuberger (D., Ore.), authorize 10-year program for construction of medical, dental, and public health educational facilities (identical with H.R. 6906, see JOURNAL, June 15, 1959, adv. p. 12).



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- ▶ *Greater utilization of your services, through increased recognition of the veterinarian as the first line of defense against livestock losses.*

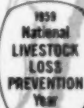
National Livestock Loss Prevention Year, in 1959 is a nation-wide movement to focus united effort against today's staggering disease losses . . . through farm magazines, newspapers, radio, television and cooperating organizations coast to coast.

It is sponsored by the member companies of Associated Veterinary Laboratories through their educational bureau: the American Foundation for Animal Health. Remember these cooperating companies whose names are listed below.

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## Veterinary Medical Education and Research for Today's Needs

GLENN C. HOLM, M.S., D.V.M.

*Stillwater, Oklahoma*

FOR THE PAST 30 years, the veterinary profession has moved from crisis to crisis. Some have been economic, others evolutionary, and still others, pure figment of the imagination. They range from the passing of the horse in the twenties and thirties to vertical integration or contract farming in the present decade.

The important thing is not that crises have been with us but that we have moved ahead of each obstacle, real or imaginary. When economic crisis confronted us, we tightened our belts and made the necessary changes. Some practitioners were lost along the way. When agricultural revolution started in the thirties, we adjusted to the change by altering the type of practice in the community and changing the teaching methods and materials in the veterinary colleges. Here again, both practitioners and students unable to adjust fell by the wayside but their places were taken by more competent individuals.

When visions of other crises seemed to be on the horizon, we planned and made adjustments to cushion the impact. Our dynamic profession has made and is making the necessary adjustments to serve an evolving agriculture and the ever growing and changing national society. We are on the threshold of our greatest opportunity to serve this nation and the world.

### THE NATION

Our national population has increased by one half during the past 30 years. The

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From an address given at the 1959 meeting of the Inter-mountain Veterinary Medical Association, Salt Lake City, Utah, Jan. 25, 1959, and published with their permission.

biggest percentage increases are in the aged and the young—both groups forcing emphasis on meat, milk, and egg production. During this same period, our population has increased its disposable income by three and one half times in current dollars (even comparing 47 to 49 dollars this usable income has more than doubled).

Coupled with this tremendous buying power is the increased leisure time of our working force. In the words of Cornell sociologists, this has meant a "flight to the fringes"—small acreages, outdoor cooking, more pets, and even 4-H projects for junior. These all have a bearing on agriculture and the practicing veterinarian.

### AGRICULTURE

For generations the American farm changed only slightly. It was limited by the amount of land a man and his family could work, the gait of the horse, methods and crops brought largely from native lands; all of these tended to resist change. In the early thirties, a dreamer in a Florida orange grove put aeroplane tires on his tractor. This was the turning point—the age of the horse began dying and the era of the machine began on our farms. The machine moved ahead, displacing work animals and releasing millions of pasture and feed land acres.

These acres have gone into crops, land for meat animals, highways, cities, airports, and acreages for the city dweller moving to the country. These changes all had an impact on our national society, but probably the most important change was that the minds of farm people were freed



from the bonds of three-mile-an-hour farming.

While our national population was increasing by one half, our farm population was decreasing by one third. In 1930, one fourth of our total population was on farms; today, less than one eighth of our people are farming. Yet each worker has increased his production to the point that he now feeds twice as many people as he did in 1930. He has done it with less land than he had even 20 years ago. How has he done it? Primarily because of "the machine," improved livestock and crop varieties, better methods, and effective disease and insect control. All are products of research and education and all are being accepted by the intelligent business man we call the modern farmer-rancher. Veterinary medicine has played an important part in this revolution.

The average livestock owner in the twenties and thirties called his veterinarian only to treat the sick animal and to stop heavy losses in his flocks and herds. This "fire engine practice" is slowly being replaced. The modern farmer-rancher calls his veterinarian to help prevent loss, to lower cost of production and increase income. If the veterinarian is not a "partner in profit," the livestock owner will find a new partner. It is purely a business proposition. Any veterinarian going into a large animal practice must have one primary goal—make money for his client. Only in the area of treating the pet, the pleasure horse, and in veterinary public health does practice move out of the realm of cold economics.

#### VETERINARY MEDICINE

In 1920 there were slightly over 12,000 veterinarians in the United States and Canada. This number dwindled until 1935 and then increased. The 1958 AVMA Directory reports nearly 21,000 veterinarians in these two countries. In 23 years our veterinary population has nearly doubled. The important aspect of our veterinary medical evolution is not so much the increase in numbers of veterinarians but the fact that each graduating class enters the profession with greater skills and competence than did members of the preceding class. The increase in services available to the livestock industry is a result of both numbers and quality.

During this transition, some segments

of veterinary medical practice were lost by default, partly because veterinarians had a greater interest in other phases of practice and partly because graduates lacked some of the skills to give complete veterinary service. We must be alert to prevent such occurrences in the immediate years ahead.

There is a growing trend in large animal work toward group or clinic practice, similar to that in the small animal field. This shift encourages needed large animal specialization, it promotes better equipment and permits a more constant and complete service. This trend has other advantages too; it affords each veterinarian more time for his family, his community, and his avocations.

#### VETERINARY MEDICAL EDUCATION

What have the veterinary colleges done to prepare the graduate for the revolution in our national society and the agricultural industry? All have changed their preprofessional requirements and altered their professional curricula. Thirty years ago, students went directly from high school into their four-year professional training period. Today there is a minimum of two years preprofessional training. At Oklahoma State University and most other professional schools, this is a minimum and means little. The 1958 Oklahoma first-year students averaged 3.6 years of college before being admitted. One half of them held B.S. or higher degrees.

Many courses formerly taught in the professional curricula are now taken during the preprofessional period. This shift gave more time for courses such as veterinary agronomics, preventive veterinary medicine, veterinary public health, surgery, radiology, ethics, clinical diagnosis, and toxicology. At the same time, courses in the humanistic disciplines were added to the preprofessional curricula to broaden the knowledge of each graduate.

A theologian, lamenting the one-sided training medical students were getting, facetiously said that these embryo physicians could effectively handle the unconscious, but with their conscious patients they would be at a loss to talk about anything but medicine. He then asked about veterinary medical students. Were they given courses that would help them to live as well as make a living? We agreed on nine disciplines—art, economics, history,



music, philosophy, political science, psychology, sociology, and religion.

Then we studied the preprofessional transcripts of all professional students enrolled in our college. The results surprised and pleased both of us. Sixty-three per cent of the students had taken from one to six courses in each of at least five of the above disciplines. This is all the more impressive when it is realized that these courses are in the elective fields. These young men may not have to talk to these patients but they are certainly competent to talk to clients, neighbors, fellow service club members, and associates not only about veterinary medicine, livestock management, nutrition, and genetics but also a host of other subjects.

Have the veterinary colleges kept pace in our changing times? To convince myself, I only have to think back 25 years when the last of the "four-year" students were being graduated. Clinic accessions for most of these classes were less than we now see for classes of half the size. Using the same standard, each of those students would have about one fourth the staff contacts our present students experience. Survival surgery was observed but rarely practiced. Students saw x-ray work but had no formal training in radiology. Meat inspection was the only phase of veterinary public health that received serious attention. Students were taught to treat the individual, but the herd approach was neglected. Yet, some of our most competent veterinarians graduated during that period. They continued to study, observe, and change their practice methods to meet today's demands; they grew with the evolution.

A recent editorial in a veterinary publication indicated that fewer than 15 per cent of the new graduates of our veterinary colleges applied their skills and talents in the aid of animal agriculture. It is difficult to give meaning to this statement unless we can determine the intent of "new" and "applied." We have an accurate record of our Oklahoma State graduates beginning with the first class graduating in 1951. These eight classes are now employed as follows: general practice—67.5 per cent; teaching and research in veterinary colleges and agricultural experiment stations—8.0 per cent; regulatory work for state governments—1.6 per cent; regulatory work and research, federal government—11.3 per cent. These classifica-

tions represent a direct application to agriculture and total 88.4 per cent.

Other areas of work are: small animal practice—7.2 per cent; veterinary corps, both army and air—3.2 per cent; the veterinary pharmaceutical industry—0.4 per cent; and graduate study—0.8 per cent, a total of 11.6 per cent. Some of the graduates in this last group are in positions where they too could be serving agriculture. Oklahoma State is but one of the veterinary colleges; however, the records of the other veterinary colleges should not be too different.

#### VETERINARY MEDICAL RESEARCH

What has been the trend in veterinary medical research? My remarks will be confined to research in the U.S. Department of Agriculture and the state agricultural experiment stations. At present, there are over 500 full-time research workers doing applied and basic veterinary medical research related to animal agriculture, 60 per cent of them in the veterinary science departments and colleges of veterinary medicine. These 300 positions would represent a much greater number of people since most are assigned to projects for only a fraction of their time.

The state experiment stations supported veterinary medical research in fiscal year 1958 at a level of approximately \$6 million. The Agricultural Research Service spent a slightly larger amount. These were "working research dollars," money spent on projects, not buildings, land, etc. Thirty years ago, veterinary medical research got one sixteenth of the financial support it enjoys today from these two sources. Added to this volume is the ever expanding basic and applied veterinary medical research in industry.

That is progress. It means that veterinary medical research has come of age. Even so, more and better trained research workers are needed to reduce our multi-billion dollar animal disease loss. There never was a time when research workers couldn't use more money, more hands, or more equipment. I hope that will always be the situation.

Research procedure has also undergone great changes. A team approach to a problem is paying bigger research dividends. Facts are being supplied faster even though year by year the questions asked of the research worker become more

difficult. If you have any question regarding the tremendous change that has come about in veterinary medical research, look at the veterinary journals and the AVMA Proceedings Book of ten, 20, and 30 years ago. Compare the numbers of papers and the quality of work being reported.

#### CONCLUSION

Has the veterinary profession maintained its place in our changing national society? I sincerely believe that we have gained new stature. Our numbers have increased, our skills have increased, our opportunities have increased, and there is an increasing understanding of the services we can render.

We are moving away from the "fire engine" type of practice and into the more rewarding phase of preventive veterinary medicine. The herd approach rather than individual treatment will become even more important as our animal agriculture continues to evolve. Contract farming, larger independent units, and cooperative milking farms require skills and knowledge we now have at our disposal and must use. The owners and managers of these enterprises are more interested in preventing losses than in treating ailing animals.

We have a dynamic profession. It will continue to be a growing, changing segment of our national scene only as long as we think and act in a positive manner in our community, our state, and nation. Emerson said, "This time, like all times, is a very good one, if we but know what to do with it."

#### Many Species Have Penis Bones

Penis bones have been reported for animals of several orders; viz., Insectivora (shrews, moles, hedgehogs), Chiroptera (bats), Carnivora, Rodentia, Lemuroidea (lemurs), and Primates (with the exception of man and new-world monkeys).

From a study of several animal species, detailed descriptions and photographs of penis bones were shown for the following: *Canis familiaris* (dog), *Vulpes vulpes* (red fox), *Vulpes fulva* (silver fox), *Meles meles* (badger), *Martes foina* (stone marten), *Arctocephalus pusillus* (fur seal), and *Procyon lotor* (raccoon).—G. Steger in *Tierarztl. Umschau* (April 1, 1959): 123.

#### Unsatisfactory Results with Nicotine Immobilization of a Deer and Brahma Crossbred Cattle—Two Case Reports

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R. P. LINK, D.V.M., Ph.D.; JACK CALHOUN, M.S.

Urbana, Illinois

The general interest in and use of the recently developed projectile syringe gun<sup>1,2</sup> has prompted the publication of the following case reports. We are aware of many gaps in the knowledge of drug dosage and individual idiosyncrasies in the use of nicotine to immobilize animals.<sup>3,4,6</sup> Many of the preparations are apparently unstandardized mixtures rather than concentrates of a purified chemical entity and as such are subject to some variation in action or effect on the treated animal. Species or individual animal variations in response to some of these preparations may be so great as to render the drugs unsafe.

#### CASE REPORTS

**Case 1. A "White African Deer" of Undetermined Species.**—Help was requested in capturing a 160-lb. pet deer that had jumped through a greenhouse window. It was shot in the neck with a projectile syringe loaded with 0.5 ml. of 80 per cent nicotine ( $\text{CH:NCH:CHCH:CCH}(\text{CH}_2)_5\text{NCH}_3$ , reagent grade) solution, with no effect. A second dose of the same material was likewise injected into the heavy muscles of the thigh, and after a brief period of excitement, the animal became comatose. It died 12 hours later without regaining consciousness.

**Case 2. Crossbred Brahma Cattle.**—The owner of 30 crossbred calves, 6 to 8 months old, requested aid in calming the animals prior to loading them in a truck. Only 1-ml. projectile syringes were available so that tranquilizing drugs could not be used. The previously mentioned solution of 80 per cent nicotine and a solution of 95 per cent nicotine ( $\text{CH:NCH:CHCH:CCH}(\text{CH}_2)_5\text{NCH}_3$ , reagent grade) were used in an attempt to immobilize the animals temporarily. During the interval of immobilization, we proposed to inject a tranquilizing drug into the affected animal.

From the College of Veterinary Medicine, Agricultural Experiment Station, University of Illinois, Urbana, and the Department of Conservation, State of Illinois, Springfield (Calhoun).

Calf 1, weighing about 500 lb., was shot with a projectile syringe containing 0.75 ml. of the 80 per cent nicotine. There was little noticeable effect within 30 minutes, although this animal was eventually driven into a barn and controlled enough to observe sweating, salivation, pupillary dilatation, and rapid respirations.

Calf 2, weighing about 550 lb., was similarly injected with 1.5 ml. of the same material and, although it did show an interval of stimulation followed by incoordination, it was active and could not be treated with a tranquilizing drug.

Calf 3, weighing about 550 lb., was likewise injected with 1.5 ml. of the 95 per cent nicotine solution. Within 20 minutes it became excited, jumped a 7-ft. fence, and caused the remaining 27 animals to stampede.

Approximately three hours after treatment, the first and second animals did become paralyzed. Calf 1 recovered and was eventually loaded for shipment. Calf 2 died approximately 12 hours after treatment. Calf 3, which received the largest dose of the drug, showed nothing beyond violent excitement. The nicotine preparations were apparently active and potent, as 2 drops of the 95 per cent solution on the tongue of a normal steer caused profuse salivation and marked rumen activity within two minutes after application.

#### DISCUSSION AND CONCLUSION

The 80 per cent solution was prepared after several bottles of commercial nicotine solution, purchased for use with the gun, failed to immobilize deer. The 80 per cent solution was used with success on numerous deer, bison, and steers both before and after these cases. Dosages for both successful and unsuccessful usages were calculated on the same basis. Recovered darts proved the projectile syringes had discharged.

We have found little specific data relative to the dosage, effects, or mortality of nicotine solutions on many species of animals. Such information for cattle, deer, dogs, and other species should be obtained and published if this technique of treatment and capture is to be widely used. So far, only a few reports of the successful use of nicotine solutions in the projectile syringe gun have been published.<sup>4,5</sup> Only the mortality in deer (8.9% of 174) has been published.

These cases are not recorded as an indictment of a drug or a method of administration. The information is given in the hope that others will be able to avoid the same errors and that more complete and accurate information along these lines may be obtained.

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#### A Sign of the Changing Times

According to a recent news item, the government, on March 30, brought anti-trust charges against the country's largest supplier of semen used to artificially inseminate dairy cattle.

The Federal Trade Commission charged that the defendant restrained trade in this specialized field through oppressive contracts—by selling to technician customers on condition they do not buy semen elsewhere.

Who would have guessed, only a few years ago, that semen sales would ever reach a volume sufficient to involve anyone in a trust suit?

#### Additional Restrictions on Imported Cured Meats

The U.S. Department of Agriculture has amended the regulations governing importation of meats from countries where foot-and-mouth disease occurs, to provide an additional safeguard against accidental introduction of this disease into the United States.

The action taken requires the drying of cured meats that are not canned prior to entry into this country. The change will not affect canned or cooked meats.—*U.S.D.A. News Release, May 11, 1959.*

## Isolated Pulmonic Valvular Stenosis in a Dog

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*New York, New York*

PULMONARY STENOSIS is a relatively common congenital cardiac defect occurring in dogs.<sup>8</sup> Most studies in animals have been based on postmortem observations due to the unavailability of special diagnostic procedures such as angiocardiology and cardiac catheterization. By taking advantage of these diagnostic aids, a diagnosis of pulmonic stenosis can be established in addition to the pathological changes which have occurred in the heart. A successful pulmonary valvulotomy in a Boxer, 21 months old, has been reported.<sup>9</sup>

The present report concerns a diagnosis in a 4-month-old Boxer, with preoperative studies and postmortem collaboration of the findings.

### HISTORY

A male Boxer, 4 months old, was examined at the Speyer Hospital-Caspari Institute because of a chronic moist cough, weakness, and retarded development. Cyanosis was entirely absent and the color of the mucous membranes was normal. The dog was underweight and a harsh systolic bruit was audible over a wide area of the anterior chest wall, but most sharply defined to the right of the sternum in the second and third interspaces. The second heart sound was hardly audible. A thrill was also palpable in this area. Moist vesicular rales were heard throughout both hemithoraxes.

No other significant abnormalities were found. A blood count taken shortly after

hospitalization revealed a hemoglobin level of 11.4 Gm. per 100 cc. and a leukocyte count of 21,700 per cubic millimeter.

### ANGIOCARDIOGRAPHY

The radiological examination was interesting and informative. The technique used in obtaining roentgenograms was patterned after the angiocardigraphic method used in man, and was modified for our use because the opacification time in a dog the size of this subject is approximately twice as fast as in man.

A 500 ma. x-ray unit equipped with rapid changer and roll film was used to obtain the radiographs. The dog was anesthetized with pentobarbital sodium and two series of radiographs were taken. The opacifying medium used was 70 per cent sodium acetiiozoate (Urokon 70\*), 15 cc. of which was injected into the right jugular vein.

An important part of this procedure is the speed at which the radiopaque material can be injected into the subject. The faster the material can be injected, the better are the results since this maintains a more compact bolus of opacifying medium. Therefore, to facilitate a rapid injection, a Robb angiocardigraphic needle\*\* attached to a 20-cc. syringe was placed in the jugular vein. This type catheter is used in angiocardigraphic studies in man. The x-ray machine is started an instant before the injection is given.

In the first series of radiographs, the dog was placed in a left lateral position. The machine was set at 200 ma., 73 kv.p., and at an exposure of 1/30 sec. A scout film was taken to determine if the machine was set correctly and to see that the dog was positioned properly. Thirty exposures were taken, three exposures per second for the first five seconds and then one exposure per second for the next 15 seconds. As observed on the chart (fig. 8) of opacification

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\*Urokon is manufactured by Mallinckrodt Chemical Works, St. Louis, Mo.

\*\*Manufactured by Becton, Dickinson and Co., Rutherford, N.J.

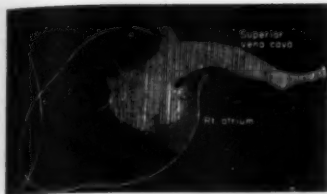


Fig. 1—First radiograph taken in the first second of a series of lateral radiographs of a dog, illustrating filling of right jugular vein, superior vena cava, and right atrium; auricular appendage is also apparent. Time elapsed since injection of contrast medium—0.5 second.

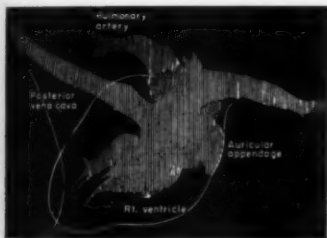
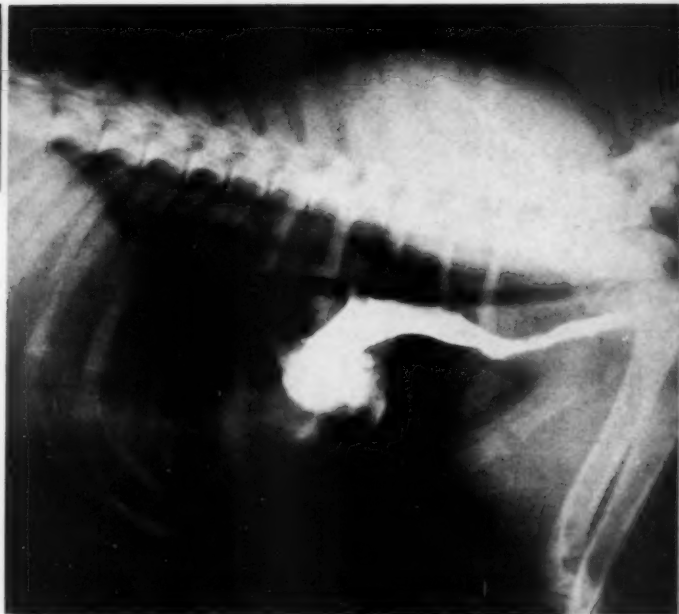
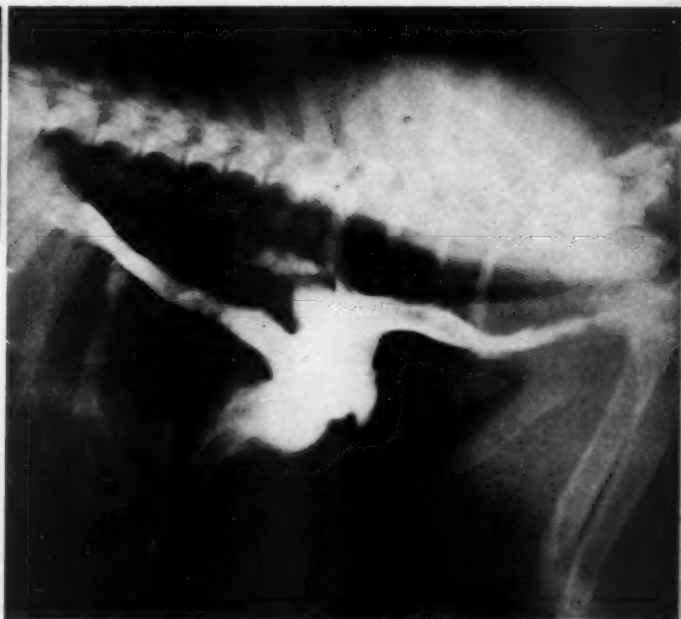


Fig. 2—Third radiograph taken at the end of the first second, illustrating normal reflux flow into posterior vena cava and prominence of right auricular appendage; filling of right ventricle and pulmonary artery now apparent at end of systole. Time elapsed—1.5 seconds.





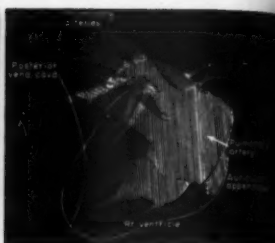


Fig. 3—Sixth radiograph taken at the end of two seconds, illustrating ventricular systole and large dilated pulmonary artery.

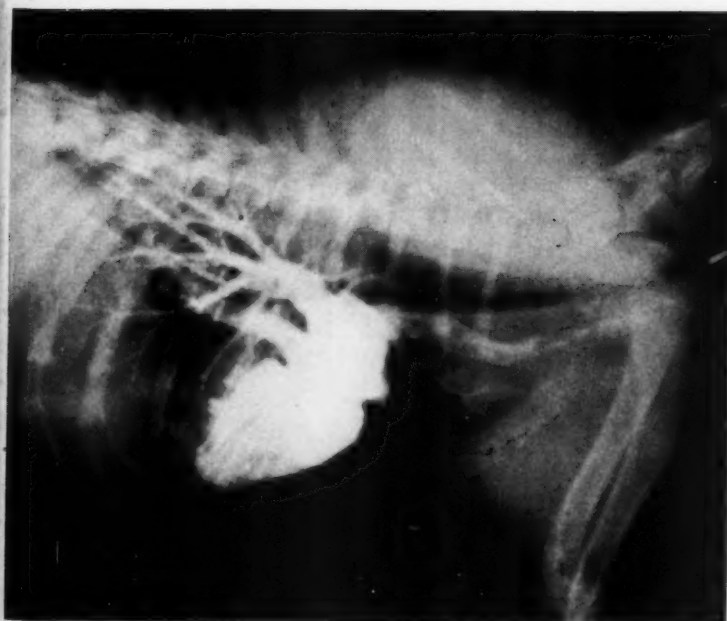


Fig. 4—Seventh radiograph, illustrating right ventricular diastole, thickened ventricular wall, and dilated pulmonary artery. Time elapsed—2.25 seconds.





Fig. 5—Eighth radiograph taken at the end of the third second, illustrating dilated pulmonary artery, auricular appendage, and conical shape of stenotic pulmonary valve.

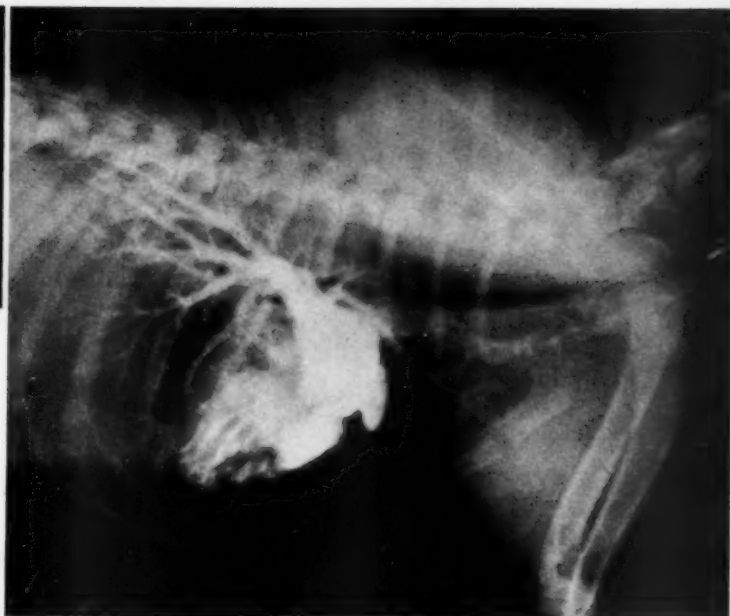
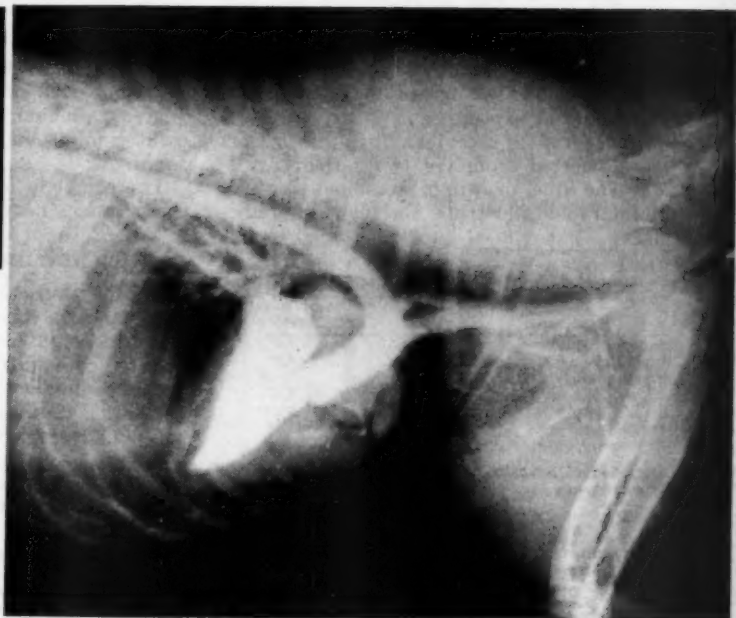


Fig. 6—Sixteenth radiograph, taken at end of sixth second, illustrating diastole of left ventricle, left atrium, and aortic valve. Arrows demonstrate inflow and outflow tracts to the left ventricle.



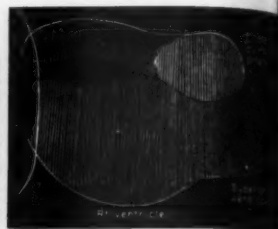
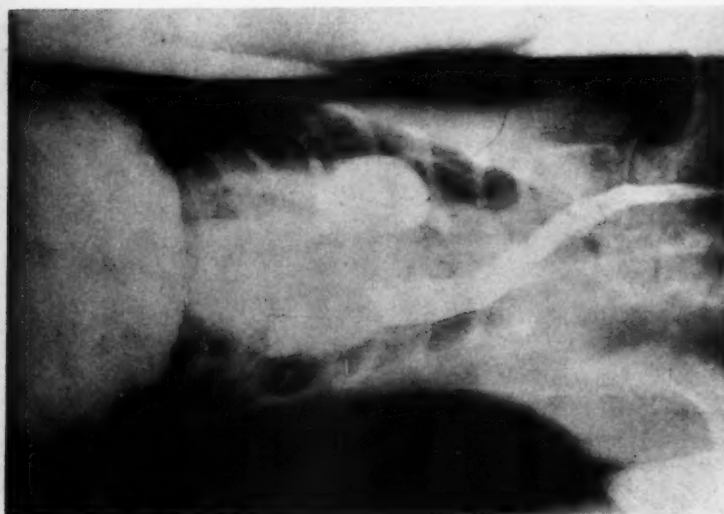


Fig. 7—Fifth radiograph, taken with the dog in anterior-posterior position, illustrating the dilated pulmonary artery.

time through the heart, it is unnecessary to take exposures for this length of time if only the heart is to be completely visualized.

A second series of radiographs was taken with the dog in a dorsal recumbent position. In this position, 200 ma. and an exposure of 1/30 second were also used, but the kv.p. was increased to 78. The same number of plates per second was taken in dorsal recumbency as was taken in the lateral position. A second injection of Urokon 70 was given along with the second set of exposures.

Radiographs accompanying this report were selected from the two series (fig. 1-7). The line drawings accompanying the radiographs illustrate the flow of radio-

paque material through the dog's heart and also show the heart lesions in this animal. To summarize the important diagnostic features of these radiographs, figure 3 shows the dilated pulmonary artery and the thickened and enlarged right ventricle. This radiograph was taken in systole and the dilated artery is much larger than that seen in figure 4 which was taken in diastole. Figure 5 shows the conical shape of the stenotic pulmonary valve and also illustrates the spherical cavities on either side of this fibrotic valve. The dilated pulmonary artery, due to the high right ventricular pressure, is also quite apparent.

The complete opacification time through this animal's heart is illustrated (fig. 8).

TABLE 1—Results of Analyses for Carbon Dioxide and Oxygen in Samples of Blood from a Dog

	Oxygen content (ml./100 ml. blood)
Superior vena cava	7.93
Right atrium	7.93
Right ventricle	
high	7.21
low	7.08
Femoral artery	13.99
Capacity of blood	14.90
Saturation of hemoglobin	94 %
Femoral artery	50.97
	(CO <sub>2</sub> content)
	Pressures (mm. Hg)
Right ventricle	
Systolic	132
Diastolic	0
Mean	32

#### CARDIAC CATHETERIZATION

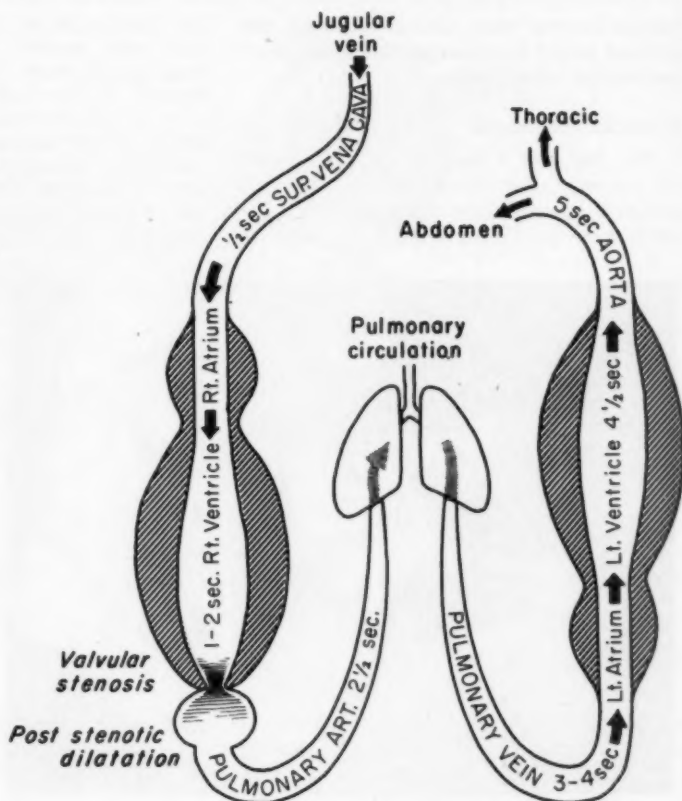
Cardiac catheterization was carried out using a No. 8 Cournand† catheter, passed from the right anterior jugular vein into the right ventricle under fluoroscopic control. Pulmonary arterial values were not obtained because of inability to catheterize the pulmonary artery.

Venous samples were taken via the catheter and an arterial sample was taken simultaneously from the femoral artery. The samples were collected anaerobically in greased, heparinized syringes and analyses

†Manufactured by American Cystoscope Makers, Inc., New York, N.Y.

Fig. 8—Time intervals required for opacification of structures after injection of a dog.

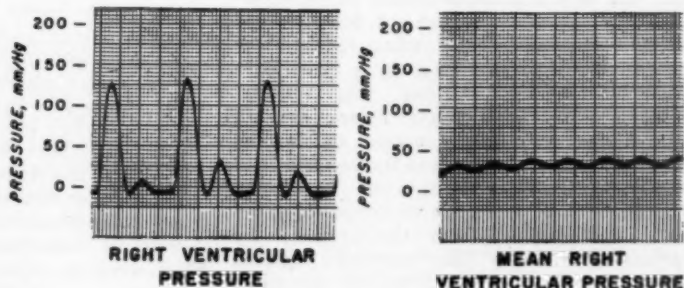
Sup. vena cava and right atrium  $\frac{1}{2}$  sec.  
Rt. ventricle & pulmonary art. .... 1-2 sec.  
Pulmonary arterial circulation .....  $2\frac{1}{2}$  sec.  
Pulmonary vein & Lt. atrium ..... 3 sec.  
Left ventricle .....  $4\frac{1}{2}$  sec.  
Thoracic aorta ..... 5 sec.



for carbon dioxide and oxygen were done by the Van Slyke<sup>10</sup> procedure. Intracardiac pressures were measured by means of the Sanborn Electron Manometer<sup>†</sup> and a direct

These data show a high right ventricular systolic pressure (the normal being 20-30 mm. Hg) due to the stenotic pulmonic valve. There were no abnormalities in the

Fig. 9—Cardiac catheterization tracings in a dog, demonstrating high right ventricular pressure.



recording (fig. 9) obtained using the Sanborn Polyviso Direct Recorder.<sup>‡</sup> The results were tabulated (table 1).

venous oxygen content or arterial saturation at rest, which substantiates a diagnosis of a purely pulmonic stenosis with intact atrial and ventricular septa.

The electrocardiogram findings in this

<sup>†</sup>Manufactured by Sanborn Co., Cambridge, Mass.

particular dog were normal although EKG changes might be expected, due to the right ventricular hypertrophy.<sup>1</sup>

#### SURGICAL PROCEDURE

The dog was 7 months old at the time of surgery. For three months prior to surgery, his activities were restricted and rales were no longer audible on auscultation.

Fibrillation began after the second suture had been inserted. A small incision was immediately made in the area outlined by the silk sutures and a Potts-Riker expanding valvulotome was introduced and manipulated so as to open the valve. The thrill was then found to be entirely absent. Electrical shock to counteract the fibrillation caused complete arrest, and manual massage was instituted. This sequence was



Fig. 10—Heart of the dog shown at necropsy. There was poststenotic dilatation of the pulmonary artery but no other cardiac changes except marked right ventricular hypertrophy.

tion of the lungs. In addition, the general condition was greatly improved due to supportive therapy.

With morphine premedication and intravenous pentobarbital sodium anesthesia, the dog was intubated with a cuffed endotracheal tube. A mixture of 95 per cent oxygen and 5 per cent carbon dioxide was administered mechanically by a Pneophore respirator.<sup>§</sup> The thorax was entered through the right fourth interspace and the lungs were lightly packed out of the field. The pericardium was incised and held by several silk stay sutures. The right ventricle was obviously enlarged. A thrill could be palpated over the area of the pulmonary valve. The markedly dilated pulmonary artery just distal to the valve was apparent.

Two interlocking No. 1 silk sutures were placed in the wall of the right ventricle and held untied for traction and hemostasis.

repeated several times but no normal rhythm was established. The heart began to dilate without muscular tone and massage was discontinued because of final cardiac failure.

#### NECROPSY

Examination of the pulmonary valve revealed that a stenosis from fusion of the cusps, with an aperture of approximately 3 mm., had been successfully opened surgically. There was a poststenotic dilatation of the pulmonary artery but no other cardiac changes except marked right ventricular hypertrophy (fig. 10, 11).

Passive congestion of the lungs and liver were the only changes noted in other organs.

#### DISCUSSION AND CONCLUSION

Congenital cardiac abnormalities occur in dogs and can be detected during life and evaluated with methods similar to those

<sup>§</sup>Manufactured by Mine Safety Appliances Co., Pittsburgh, Pa.

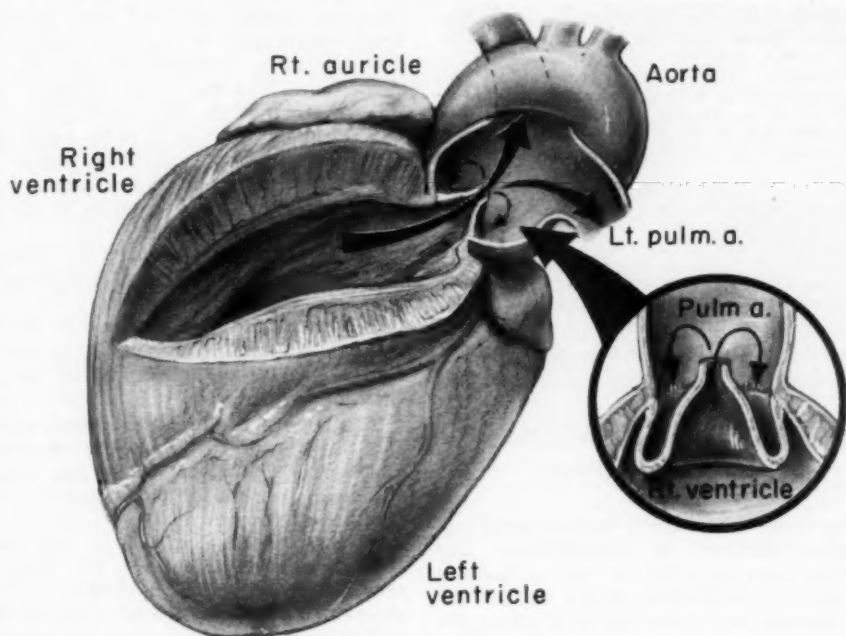


Fig. 11—Sketch of the heart shown in figure 10.

currently being used for man. In this case, a closed procedure<sup>2,3</sup> was elected and the postmortem findings demonstrated an apparently adequately opened pulmonary valve.

With the present developments and refinements in techniques for various types of cardiopulmonary bypass and open cardiectomy, many investigators have expressed the desirability of using techniques of open rather than closed cardiac procedures, to insure adequate and accurate valvulotomies and also to permit correction of associated defects. These methods can well be adapted and are being adapted to operative procedures in animals.

Angiocardiography and cardiac catheterization are important adjuncts to the diagnosis of cardiac abnormalities. By use of these diagnostic procedures, it is possible to diagnose and evaluate the extent of the existing lesions, resulting in a more accurate prognosis and choice of treatment. By means of angiocardiography, a direct visualization of the heart is possible, demonstrating filling and structural defects as each chamber is opacified. Its importance

in future cardiac work in animals should progress as it did in human medicine where it is now an accepted, well-recognized, and almost fully standardized procedure.<sup>3</sup>

The dog has a high position of prestige in the advancement of cardiovascular problems. By a combined effort of the veterinary and medical professions, refinements both in accurate diagnoses and treatments will establish a mutual gain for both man and animal.

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## The Standing Position for Abdominal Cryptorchidectomy in the Horse

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The ease with which such routine abdominal surgery as rumenotomy and oophorectomy is performed on the standing cow led to the selection of this position for the removal of a testicle retained in the abdominal cavity of a horse. The marked advantages of this procedure seemed worthy of reporting.

### CASE REPORT

*History and Physical Examination.*—On Oct. 22, 1956, a 1,200-lb. quarter horse, 4

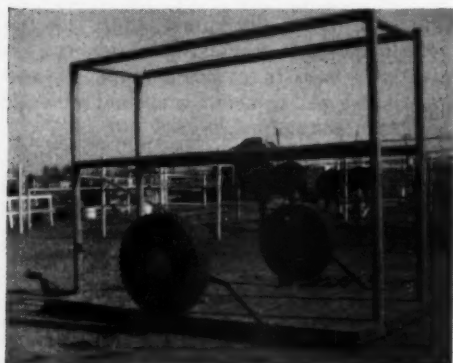


Fig. 1—A portable equine stock used for abdominal cryptorchidectomy; it is immobilized, with wheels raised, and ready for the horse.

years old, in good physical condition was presented for examination. A history of

Dr. Burger is a general practitioner in Bakersfield, Calif.

previous operations was not available. When purchased by its new owner, the presence of a retained testicle was not suspected. However, the animal soon showed stallion-like characteristics so feed was withheld for two days to facilitate a rectal examination. A retained testicle was found suspended in approximately the position the left ovary occupies in the non-pregnant mare.

In preparation for surgery the following day, one third of the grain ration was the only feed allowed.

*Restraint and Anesthesia.*—A portable equine stock (fig. 1) was used, but this was not essential for the success of the procedure.

The horse's head was cross-tied, and his tail was tied up to the stock's horizontal cross bar. The left flank was clipped, thoroughly scrubbed, and disinfected with tincture of iodine.

A sedative dose of 20 cc. of sodium pentobarbital (Nembutal\*) was given intravenously. Regional anesthesia was achieved by three 10-cc. paravertebral injections of 2 per cent hexylcaine hydrochloride (Cyclaine\*) containing 150 units of hyaluronidase (Haglodase\*) per 120 cc., using a 4-inch 19-gauge needle, and the operative area was outlined dorsally and anteriorly with 1 per cent solution of this mixture given subcutaneously. Superior anesthesia resulted, in the last case, from using 10 cc. of promazine hydrochloride (Sparine\*) intravenously and 1 per cent lidocaine hydrochloride (Xylocaine\*) along the line of incision.

*Operative Procedure.*—A 6-inch vertical incision was made through the skin of the left flank and then through the external abdominal oblique muscle. Although the animal showed no evidence of pain, a twitch was applied for the remainder of the operation. The internal abdominal oblique muscle was spread by blunt dissection with the fingers. The abdominal peritoneum was entered with the extended four fingers in a quick thrusting motion. The testicle was quickly located and removed with the chain *ecraseur*.

In suturing, no attempt was made to locate the peritoneum. The internal ab-

\*Nembutal is produced by Abbott Labs., North Chicago, Ill.; Cyclaine by Merck Sharp and Dohme, Philadelphia, Pa.; Haglodase by Haver-Lockhart Labs., Kansas City, Mo.; Sparine by Wyeth Labs., Philadelphia, Pa.; and Xylocaine by Jensen-Salsbery Labs., Kansas City, Mo.



dominal oblique muscle was drawn together with three single interrupted wire sutures; the external abdominal oblique muscle was closed in similar fashion. The skin closure was effected with horizontal mattress sutures of steel wire.

Tetanus antitoxin (1,500 units), penicillin (2 million units), and dihydrostreptomycin (2.5 Gm.) were the only postoperative drugs administered. The rectal temperature was checked daily for three days and remained normal. Eight days after the operation the skin sutures were removed (fig. 2).

#### DISCUSSION AND CONCLUSION

Some advantages of this position for a true abdominal cryptorchidectomy are:

1) The visceral organs are uncrowded and in their normal relationship to each other, which facilitates locating the retained testicle.

2) The vertical incision is not easily contaminated by air-borne contaminants.

3) There is no postoperative struggle to jeopardize sutures, as often occurs following general anesthesia.

4) It is a comfortable position for the surgeon, resulting in a more controlled and unhurried procedure.

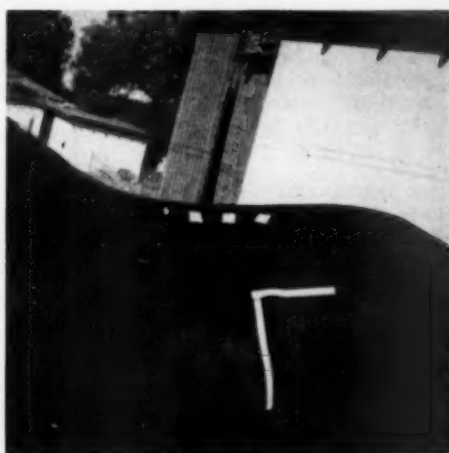


Fig. 2—Photograph of the horse eight days after abdominal cryptorchidectomy. The adhesive tape dorsally and anteriorly illustrates the line of infiltration; the three squares of tape designate the points used for the paravertebral injections.

5) This position could be utilized for exploratory laparotomy, cystotomy, and other abdominal surgery.

#### ADDENDUM

This procedure has been successfully employed on 3 additional horses during 1956.

### Spontaneous Rupture of Cow's Uterus

A 7-year-old cow, in Britain, developed typical parturient paresis after calving. She responded to routine calcium therapy, but the next morning, was again recumbent and had a subnormal temperature, a distended abdomen, and frequently grunted as if in pain. On the third day, she was still depressed and had a subnormal temperature and frequently passed dark-colored liquid feces accompanied by straining and painful grunting. Rumenal stasis was complete. She had passed her fetal membranes.

On the fourth day, she was acutely ill and a foreign body gastritis was suspected. Upon rumenotomy, no foreign body was found but, on abdominal exploration, a portion of the fetal membrane was found on the abdominal floor.

Since the uterus could not be examined from this position, the incision was closed and another made low in the left flank as if to perform a cesarotomy in a standing position. A 4-inch tear was found near the

tip of the left horn of the uterus. The wound was closed with two lines of catgut suture, dressed with penicillin, and the abdominal wall was sutured, after inserting chlortetracycline into the abdominal cavity.

The cow was given penicillin for four days and seemed normal in ten days. She continuously fed her large calf. Why her temperature remained subnormal until the uterus was repaired is not clear.—K. G. Morgan in *Vet. Rec.* (March 14, 1959): 207.

### Estrous Cycles of Certain Heifers

The average duration of 97 estrous periods of 17 low-fertility heifers was 19 (17 to 21) hours. Ovulation occurred 12 (10.5 to 13.5) hours after the end of estrus. Ovulation failed to occur in 18 per cent of the cycles. There was no significant correlation between the duration of estrus and the time of ovulation.—D. Olds et al. in *J. Dai. Sci.* (March, 1959): 543.

# Clinical Data

## The Current Status of Bovine Dwarfism

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P. W. GREGORY, Ph.D.

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THE VETERINARIAN should be interested in bovine dwarfism because it is a threat to the efficient production of beef, and he can be of service in the solution of the problem. This report is based primarily upon the work of a University of California research team composed of members of the Department of Animal Husbandry and the School of Veterinary Medicine. Even though the problem has been considered primarily one of genetics, progress is dependent upon research in many of the basic zoological disciplines and the integration of the findings from each.

A statement of two opposing views concerning the problem of dwarfism is presented, with a brief description of each. Evidence developed by the California research group will be presented in support of one of these views.

said that the single most important feature is the *definition* of dwarfism, for the definition is the basis for the interpretation of its mode of inheritance and for the evaluation of all proposed measures of correction.

The original definition of dwarfism, and the one held by most today, was based on the early studies of the inheritance of the brachycephalic (snorter) dwarf, the type that is generally recognized as plaguing beef producers. These studies indicated this dwarf to be conditioned by one autosomal recessive gene.<sup>1,3,5</sup> The latter two reports were based exclusively upon field data supplied by breeders who recognized only the one type of dwarf—the conventional short-headed (brachycephalic) dwarf, or “snorter dwarf.” According to this view, the cattle population can be al-

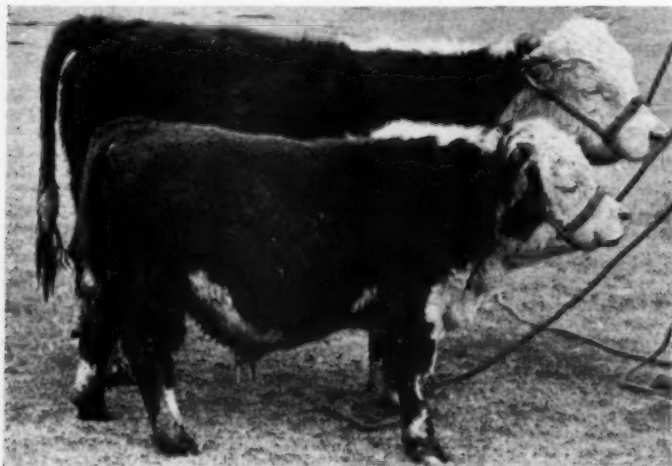


Fig. 1—Twin male Herefords, 14 months of age. The animal in the foreground is a typical short-headed dwarf weighing 362 lb. Notice the short face, bulging forehead, enlarged abdomen, and short legs. The normal twin's weight at the time of this photograph was 533 lb.

If the current status of bovine dwarfism can be summarized briefly, it should be

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Presented before the Section on Surgery and Obstetrics, Ninety-Fifth Annual Meeting, American Veterinary Medical Association, Philadelphia, Pa., Aug. 18-21, 1958.

Anatomic investigations were supported in part by a grant from Swift & Company, Chicago, Ill.

lotted to three groups with respect to dwarfism; the dwarf, the carrier or heterozygote, and the homozygous normal or “clean” animal.

When in 1954 it became apparent that other types of dwarfs existed, and that all types were genetically related, the simpler view of but one type of dwarf was

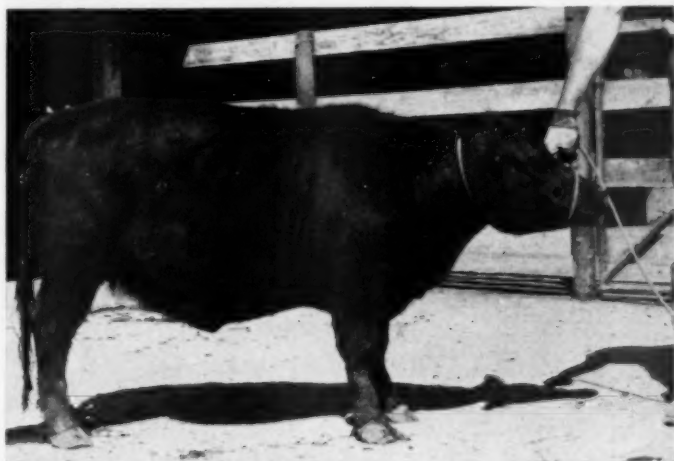
discarded. Dwarfism is a *complex* and occurs in a variety of phenotypic forms. This concept is not generally accepted but is becoming more tenable as knowledge of the problem accumulates.

Increasing evidence indicates that the beef cattle population is divided into several groups with respect to dwarfism.

type, and is characterized by an extremely long head as indicated by a mean head length/head width index of approximately 2.0. This type is frequently observed in Aberdeen-Angus and has been observed in Herefords and Shorthorns (fig. 2).

"Intermediate" Dwarf.—This is, as yet, an ill-defined group of animals which ex-

Fig. 2—Long-headed dwarf; Aberdeen-Angus female, 24 months of age, weighing 475 lb. This type is also seen in Herefords.



#### SUBDIVISIONS OF THE CATTLE POPULATION

##### DWARF TYPES

###### *Brachycephalic or Short-Headed Dwarf.*

—This is the most common type, the easiest to diagnose, and the type once thought to be the only variety (fig. 1). It is characterized by a short, broad head with a mean cephalic index (head length/head width) of approximately 1.75. This index will consistently distinguish brachycephalic dwarfs from other dwarf types and from normal animals.

In addition, these animals are characterized by a bulging forehead which persists into adulthood, an undershot jaw, an overly mature appearance when young, an enlarged abdomen (particularly evident in older specimens), and short legs. A mild form of internal hydrocephalus is present. Labored breathing is generally observed in this variety of dwarf and is responsible for the descriptive term "snorter." This type is prominent in the Hereford breed but occurs in other breeds of beef cattle as well.

###### *Dolichocephalic or Long-Headed Dwarf.*

—This is a slightly larger, more vigorous

hibit some of the characteristics of either of the foregoing varieties or of the following type. It may be possible, at a later date, to subdivide this type, depending upon the presence of consistent sets of morphological characteristics. Or, it may be possible to include specimens of this variety in one or more of the other dwarf groupings. Thus, in the current status of bovine dwarfism, the classification "intermediate" dwarfs should be considered a tentative one, and one subject to change after additional study.

Because of the highly variable appearance of these animals, no illustration of a specimen is presented. At this time, no consistent set of characteristics is recognized by which an individual might be considered a typical specimen of an "intermediate dwarf." As stated, they share characteristics of the other groups. There is little question that members of this variety of dwarf would be considered abnormal by any observer; however, ordinarily they would not be suspected as being members of the dwarf complex. The existence of animals having characteristics common to other dwarf forms, but having

some characteristics which differ, is of considerable interest, since these features support the concept of bovine dwarfism being a complex.

*Compressed.*—These animals are definitely subnormal in size and usually vary from

status with reference to the dwarf complex is unknown.

The definition of "normal" cattle is difficult. There is a lack of precise biological information which can be used as standards to compare mutant stocks.



Fig. 3—Compressed Hereford cow, 7 years of age (foreground), 935 lb. For contrast, the cow has been placed in front of a 5-year-old cow of normal size (1,350 lb.).

approximately 65 to 90 per cent of normal size, depending upon the criterion of size used and the stature of the "normal" stock used for comparison (fig. 3). Even with these differences, without precise diagnostic criteria, there may be overlaps between compressed and normal. Those that are low-set and blocky are often considered "typey," while others may be thin-fleshed and quite angular. Both types are about the same height. In general, they exhibit fair vigor, somewhere near that possessed by normal cattle. This seems to be the most variable of the dwarf groups and, with the development of additional objective diagnostic characteristics, may be divided into subgroups.

#### ANIMALS OF "NORMAL" SIZE

As indicated, these animals are of normal size; that is, their growth approximates the standards established for the particular breed. For a working classification, it is considered that these animals must consist of three genotypic varieties: (1) heterozygotes or known carriers, (2) truly normal animals, and (3) genetically unclassified. The last is by far the largest group and consists of all animals whose

This handicap must be overcome, at least in part, before extensive progress can be made toward solution of problems such as that presented by bovine dwarfism.

The concept of bovine dwarfism as being a complex differs from the simpler view in that more types are encompassed. It includes the long-headed dwarf, considered by many to be unrelated to the common brachycephalic type; it includes many intermediate forms which ordinarily would not be suspected by many persons as being related to bovine dwarfism; and it includes compressed animals which previously have been considered "normal." Evidence is being gathered in support of the contention that bovine dwarfism is a complex. Some of these bodies of evidence are circumstantial; others have been developed from research efforts extending over a period of five to seven years. Some of the following points in evidence of bovine dwarfism being a complex are subjects which will be published in more detail elsewhere.

#### EVIDENCE THAT BOVINE DWARFISM IS A COMPLEX

1) Dolichocephalic and brachycephalic dwarfs occur in the same sibships along

with other types subnormal in size that are members of the dwarf complex and along with "normal" animals.

2) It is commonly recognized that herds composed largely of compressed-type animals have a notoriously high incidence of brachycephalic dwarfs.

3) Brachycephalic dwarfs are identical, that is, they are involved by the same dwarfing process, whether they result from mating of compressed cattle or from cattle of normal size.

4) Compressed animals, dolichocephalic dwarfs, and intermediate dwarfs have structural characteristics which appear to be modifications of those found in the more extreme brachycephalic type of dwarf and which are manifestations of achondroplasia.

gene conditions the brachycephalic (snorter) dwarf indicate that an inordinately high percentage of the tests that indicate a bull is dwarf-free later prove inaccurate. This is to be expected if the hypothesis of inheritance, upon which the test is based, is in error. Results from all the mating tests at the University of California indicate that the brachycephalic dwarf is not conditioned by a single recessive gene but several loci are implicated, and that dwarfism is a complex made up of several different morphological forms.<sup>2</sup>

#### WHAT CAN BE DONE TODAY?

The properly applied progeny test is the only approach available at this time. It must be emphasized that results of prog-

Fig. 4—Bodies of sphenoid and occipital bones and the metacarpal bone of a calf which was born dead, or killed soon after birth. Predators had partially devoured the carcass when it was found. Sufficient fragments remained to identify the calf as a brachycephalic dwarf and thus incriminate its sire. Notice that the sphenoccipital synchondrosis is almost completely fused (arrow). Dimensional analysis of the metacarpal bone provided further evidence that the animal was a dwarf.



Fig. 5—The metacarpal and a sagittal section of the cranium of a Hereford calf. The carcass had undergone exposure in the Utah desert for three months before the remains were submitted for examination. As in the case illustrated in figure 4, a fused sphenoccipital synchondrosis and dimensional analysis of the metacarpal bone disclosed the calf to have been a conventional short-headed dwarf.

sia. Much more research must be done on this phase.

5) Reports of progeny tests based upon the hypothesis that one autosomal recessive

any tests, as frequently employed today, are often misleading. Two essential features must be considered. The most important of these is the *definition* of dwarfism



to be employed as the basis for the progeny test. Most breeders recognize but one type of dwarf—the brachycephalic variety. Yet, evidence such as that presented is available to show that there are other, related dwarf types. Unless these are recognized, results of a progeny test cannot be accepted as a valid index of dwarfism in a herd.

The second essential feature in the application of the progeny test is that *all* progeny must be examined. No progeny should be excluded. All early deaths, "knot-heads," "hydrocephalics," and all "freaks" must be examined. Many such animals may represent modifications of the processes responsible for the dwarf complex; or they may independently show characteristics of dwarf types. Some of the results of anatomic investigations are directly applicable to the problem of examination of progeny which contribute to a progeny test. Frequently, parts of carcasses have been sufficient to identify a calf as a dwarf and, therefore, to incriminate its sire. It has been our experience that even carcasses partially devoured by predators may contain the parts essential to the diagnosis of dwarfism (fig. 4, 5).

#### RESEARCH EFFORTS

Anatomic investigations have been directed toward a description of the members of the dwarf complex. The first type to receive attention was the most severely involved variety, the brachycephalic dwarf. Many of the results of anatomic investigations can be employed toward the more successful application of the progeny test.

It has been established that the process responsible for the brachycephalic dwarf is a mild hypoplastic achondroplasia, a disease which is poorly understood and for which there is no known remedy. This diagnosis has not been a popular one, since it indicates (according to current knowledge) that the condition cannot be corrected. The significance of these observations has generally been ignored, although these findings were reported as early as 1957.<sup>4,6</sup>

The conclusions are based on two pieces of evidence. First, it was discovered that in dwarfs early closure of the spheno-occipital synchondrosis occurred.<sup>4</sup> In normal cattle, closure of the spheno-occipital synchondrosis occurs between the twenty-fourth and thirty-sixth months. In brachycephalic dwarfs, closure may occur as early as the

first day after birth. This phenomenon is generally accepted as a pathognomonic lesion of achondroplasia.

Secondly, it was discovered that the dwarfing process resulted in shortening of only the diaphyses of the bones of the appendicular skeleton.<sup>6</sup> This is another feature characteristic of achondroplasia. Investigations concerning the dimensional analyses of the diaphyses are proving applicable to investigations utilizing radiology of skeletal elements as a means of diagnosis and prognosis. These techniques are being refined and will find wide application.

The investigations concerning the spheno-occipital synchondrosis have been extended. An intermediate group of cattle represented in part by a number of compressed-type animals has been encountered. In these, closure of the spheno-occipital synchondrosis occurs between nine and 18 months. It indicates that at least some of the members of the dwarf complex are involved by modified processes of achondroplasia, the process responsible for the brachycephalic type.

Recently, new investigations have disclosed intracranial projections occurring at the junction of the wings of the sphenoid and frontal bones, and at the junction of the lateral masses with the squamous portion of the occipital.<sup>7</sup> It appears that these are more prominent and frequent in skulls of animals which manifest achondroplasia.

Anatomic investigations are progressing in the search for new objective criteria, measurable anatomic features, in the extreme dwarf types. When characterized, the expression of these features will be investigated in other dwarf types. Such investigations, when correlated with the ever-increasing information being derived from genetic studies, should contribute to the presentation of a more clear picture of the nature of the dwarf complex, and to the presentation of more specific recommendations for correction.

#### SUMMARY

1) Bovine dwarfism is a *complex*; at least four subgroups of dwarf types can be recognized.

2) Available evidence for the concept that bovine dwarfism is a complex is outlined.

3) The progeny test is the only tech-



nique available today which can be used toward the resolution of the "dwarf" problem." However, this approach is of little value unless *all* of the types of dwarfs are to be recognized and unless *all* progeny resulting from test matings receive careful examination.

4) Current research on bovine dwarfism at the University of California is briefly reviewed. Some of the results of anatomic investigations can be applied to improve the results obtained from progeny testing.

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## Cerebrospinal Fluid Pressures of Snorter Dwarf-Carrier and Noncarrier Cattle

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DURING A SERIES of experiments designed to locate a detectable difference between snorter dwarf-carrier and noncarrier cattle, it was necessary to develop a method of measuring cerebrospinal fluid pressure in mature beef cattle. One method that has been described utilized a manometer filled with physiological saline solution to measure the cerebrospinal fluid pressure in dairy heifers.<sup>4</sup> Measurements were made on nonanesthetized dairy heifers up to 2 years of age, with the animals standing in an upright position. Another method has been used in measuring the cerebrospinal fluid pressure in anesthetized swine.<sup>3</sup>

#### EXPERIMENTAL PROCEDURE

Spinal punctures were made on a total of 41 snorter dwarf-carrier and 19 non-carrier Hereford cows from 4 to 14 years old. As judged from general appearance

and reproductive performance, they were on an adequate plane of nutrition. Measurements were made on 20 in March, 1957, 20 in July, 1957, and the remaining 20 in April, 1958.

An Ayer spinal fluid manometer (fig. 1) was found to be satisfactory for measuring pressure and for the withdrawal of fluid. This apparatus consists of two glass manometer tubes graduated in millimeters, a special three-way stopcock, and a 20-gauge, 3½-inch rustless spinal needle with stylet. The apparatus is adaptable for field use, since it can be sterilized by chemical disinfectants.

Movement of the animals resulted in an increased pressure reading; therefore, it was deemed necessary to anesthetize the animals before taking measurements. Sodium pentobarbital (Nembutal\*) in sterile solution injected intravenously 450 to 510 mg. per 100 lb. of body wt. was a satisfactory anesthetic. The animals were laid in lateral recumbency, using a method described in 1950.<sup>1</sup> The anesthetic was then injected into the jugular vein and the rope used to throw the animal was removed. The spinal column was maintained as nearly horizontal as possible. Hair in the vicinity dorsal to the atlas-axis joint and to the

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\*Nembutal is produced by Abbott Laboratories, North Chicago, Ill.

lumbar vertebrae was clipped and the clipped areas were disinfected.

Spinal punctures were made in the median plane, between the atlas and axis vertebrae and between the third and fourth or the fourth and fifth lumbar vertebrae. In some cases, it was necessary to make the posterior puncture between the last lumbar and first sacral vertebrae. At the atlas-axis joint, the needle was directed ventrally and in the lumbar region it was directed ventrally and anteriorly. The depth of the



Fig. 1.—Reading the spinal fluid pressure at the atlas-axis joint in an anesthetized cow by means of an Ayer spinal fluid manometer.

puncture varied with the age and degree of fatness of the animal.

A slight "give" was felt, first when the needle passed through the skin, and again when it passed through the dura and arachnoid layers into the subarachnoid space. When the needle was inserted too deeply, the point came into contact with the body of the vertebra. In such instances, the

needle was withdrawn slowly. The stylet was withdrawn when it was thought that the needle had entered the subarachnoid space. The first drops of fluid usually appeared after a few seconds. If the fluid did not appear, or if the flow was not sufficient, a slight withdrawal or rotation of the needle allowed the fluid to flow freely.

When the fluid was observed in the needle, the stockcock apparatus, with the graduated glass tubes in a vertical position, was attached to the needle. The fluid was allowed to rise in the tube until it came to rest, at which point the height of the fluid, in millimeters, was recorded. A 4- to 6-mm. fluctuation in the level of the fluid resulted from the inspiration and expiration of air in normal respiration. An absence of the pulsations usually indicated lodging of tissue on the needle point.

After the initial pressure reading was recorded, an assistant applied pressure to the thorax of the animal. The fluid usually ascended rapidly in the tube when pressure was applied and subsided slowly when the pressure was released. Failure of the fluid to ascend rapidly indicated an obstruction in the needle or a subarachnoid block, which indicated an abnormal pressure reading.

Replicate studies were made using a specific group of cattle. Measurements were made on a group of cattle within the same month; whereas, comparisons were available from others at an interval of one year. Statistical comparisons between animals which were assumed to be noncarriers and those which were known carriers were made by variance analysis.<sup>2</sup>

#### RESULTS AND DISCUSSION

The cerebrospinal fluid pressures obtained at the atlas-axis joint in dwarf-carrier cattle were lower than those obtained from noncarrier cattle at the same joint; this difference was highly significant ( $P=0.01$ ). The pressures obtained in the lumbar region in the two groups of cattle were not significantly different. There was no significant difference when the tests were repeated, which indicates that the method was satisfactory. The mean cerebrospinal fluid pressures obtained are shown (table 1).

A summary of the analyses of variance for the data from which this table was computed is also shown (table 2).

TABLE 1—Mean Cerebrospinal Fluid Pressures, in Millimeters, Obtained from Dwarf-Carrier and Non-Carrier Cows

Genotype of cows	No. of animals	Atlas-axis joint	Lumbar region
Non-carrier	19	279.0 ± 34.5	229.0 ± 40.6
Carrier	41	238.0 ± 30.0	194.0 ± 42.4

The feasibility of using the cerebrospinal fluid pressure as a means of carrier differentiation is rather dubious, in view of the area of overlap which exists between the two groups.

Many different disturbances such as muscular action, coughing, pressure on the rib cage or on the abdomen, differences in position, mental excitement, and fear can cause fluctuations in cerebrospinal fluid pressure. It is, therefore, imperative that the cattle be anesthetized.

This operation was performed on 60 mature beef cattle without detrimental effects. It appears that the measurement of cerebrospinal fluid pressure is rarely fatal if the animal is anesthetized properly and the spinal pressure is not lowered by the removal of an excessive quantity of fluid or

TABLE 2—Analyses of Variance Showing the Means Squares for a Comparison of Cerebrospinal Fluid Pressures Obtained from Dwarf-Carrier and Non-carrier Cows at Two Points of Puncture

Source	df	Atlas-axis joint	Lumbar region
Replications	1	0.05	19.38
Genotypes	1	167.89*	38.68
Replication × genotypes	1	16.55	15.48
Error	28	18.21	16.46

\*Highly significant P=0.01; df—degrees of freedom.

by drainage of fluid through the puncture canal.

### SUMMARY AND CONCLUSIONS

A method is described for determining the cerebrospinal fluid pressure of cattle by punctures between the atlas and axis vertebrae and in the lumbar region.

The difference between the readings taken in the lumbar region was not significant.

The cerebrospinal fluid pressures at the atlas-axis joint in dwarf-carrier cattle were lower than those of noncarrier cattle at the same joint; this difference was highly significant (P=0.01).

An area of overlap between the dwarf-

carrier and noncarrier groups prevents the use of cerebrospinal fluid pressure at the atlas-axis joint as a feasible differentiating factor.

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### Diseases Relating to Abortion in Cattle

Infectious diseases capable of directly causing abortion in cattle include brucellosis, vibriosis, leptospirosis, and trichomoniasis. Other infectious and contagious diseases may be similarly responsible for abortion or early embryonic death but these infectious agents have not been identified.

Systemic diseases may indirectly produce abortion as one of the signs of the specific infection. These include virus diarrhoea, listeriosis, tuberculosis, toxoplasmosis, shipping fever, mucosal disease, pseudorabies, winter dysentery, and encephalomyelitis. Sporadic abortions may also be due to miscellaneous bacteria, molds, poisons, trauma, and nutritional and endocrine deficiencies.

Accurate diagnosis, including routine laboratory examination of all the aborted fetuses and carefully selected specimens from both the cow and herd sire, is the key to solving the mystery surrounding an outbreak of premature birth in cattle.—L. E. Boley, D.V.M., M.S., Urbana, Ill., at Feb., 1959, Meeting of the Chicago V.M.A.

### Protein Content of Mastitic Milk

Milk from cows with mastitis had a lower content of total protein, casein, and albumen but a higher globulin content than did normal milk. The albumin-globulin ratio was highest in normal milk and lowest in milk from cows with acute mastitis.—*Vet. Bull. (April, 1959): Item 919.*

# Angiocardiography for the Clinical Diagnosis of Congenital Heart Disease in Small Animals

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BECAUSE OF ADVANCED techniques in veterinary cardiovascular surgery, identification of the particular congenital cardiac anomaly is necessary to provide a prognosis and to determine both the feasibility and the approach for corrective surgery. Based on veterinary surgical considerations, the following is a recommended classification of congenital cardiac anomalies.

## Group I. No surgery recommended.

Subgroup A: Benign lesion not affecting longevity (e.g., anomalous mammary artery).

Subgroup B: Lesion so severe that operative prognosis is poor or surgery is impractical at present time (e.g., transposition of great vessels).

## Group II. Operable by routine thoracic surgical procedures (e.g., patent ductus arteriosus).

## Group III. Operable by open-heart surgery.

Subgroup A: Without cardiac by-pass (e.g., valvular pulmonic stenosis, heartworm removal).

Subgroup B: With extracorporeal circulation (e.g., infundibular pulmonic stenosis, septal defects).

A tentative diagnosis and surgical classification may be made by thorough physical examination including auscultation of the heart and lungs, complete blood count with hemoglobin and hematocrit determinations, and standard lateral and dorsoventral radiographs. This may be supplemented by venous and arterial blood pressure recordings and by electrocardiograms.

The definitive diagnosis of the particular congenital cardiac anomaly is obtainable only through cardiac catheterization<sup>2</sup> or angiocardiography,<sup>1</sup> or both. The former is a highly technical procedure which requires expensive and elaborate equipment, and usually prolonged exposure to fluoroscopy. In short, it is suitable only when performed at a heart station. Angiocardiography, however, may be effectively,

safely, quickly, and inexpensively accomplished with no more than a radiograph unit and radiopaque contrast medium. With this method, definitive diagnoses of the particular congenital heart defect in 20 dogs and 2 calves have been made.

The purpose of this paper is to describe a simple and accurate clinical method for roentgenographically recording the sequence and magnitude of filling of various heart chambers and great vessels with contrast medium-angiocardiography.

## THEORY

Two possible methods for angiocardiography are available, depending upon (1) the tentative diagnosis and (2) which chambers and great vessels of the heart the clinician wishes to outline. In venous angiocardiography, radiopaque contrast medium is injected into the jugular vein; and a radiograph of the thorax taken immediately following will show filling of the venae cavae, vena azygos, right atrium, right ventricle, main pulmonary artery, and left and right pulmonary artery. If the exposure is made during injection, one may obtain selective opacity of only the great veins and right atrium, or of only the great veins, right atrium, and right ventricle.

In arterial angiocardiography,<sup>4</sup> contrast medium is injected directly into the left ventricular lumen through the thoracic wall. This outlines the left ventricle, aorta, and the great arteries arising from the aorta, including the coronary arteries. In animals with mitral insufficiency, the contrast medium will, in addition, regurgitate into the left atrium and outline it as well.<sup>1</sup> Left ventricular puncture is performed with only slightly greater risk than in venous angiocardiography.

Excellent angiocardiograms may be obtained with exposure time of 0.1 sec.; however, for veterinarians who have "slower" x-ray units, adequate results may be obtained with exposure time of 0.25 sec.

Various radiopaque substances at various concentrations have been used satis-

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factorily for angiocardiology;<sup>1</sup> however, 90 per cent diatrizoic acid has given the best results with fewer signs of toxicosis. Before using, the material should be warmed and thoroughly mixed to insure as complete homogeneity of the solution as possible. Excellent opacification with optimum safety for the subject has been obtained with the doses shown (table 1).

TABLE 1—Recommended Doses of Radiopaque Material for Angiocardiology in Animals

Body weight	Venous angiocardiology	Arterial angiocardiology
Under 10 lb.	3 cc.	3 cc
10 lb. to 40 lb.	1 cc./3 lb. body wt.	1 cc./4 lb. body wt.
Over 40 lb.*	20 cc.	12 cc.

\*Applicable for calves and foals also.

Since best results are obtained with rapid injection of the contrast medium so as to form a bolus as nearly as possible, a 2-inch, 16-gauge needle is used for jugular puncture and a 3-inch, 18-gauge needle is used for the intracardiac injections. For pups and smaller animals, a smaller needle may be used, and for larger dogs, calves, and foals, a larger-gauge needle may be used.

#### PROCEDURE

The animals are given a short-acting general anesthetic to effect light surgical anesthesia. Although we have done angiocardiology in unsedated, unanesthetized animals, less body movement makes for clearer radiographs and less chance of tearing either the jugular vein or the left ventricle.

The animal is placed on its right side with the cassette adjusted so as to include all portions of the thorax in which the clinician is interested. Depending upon whether venous or arterial angiocardiology is desired, the respective areas are clipped, scrubbed with antiseptic soap, and rinsed with alcohol. A pilot radiograph is then taken to assure proper exposure and positioning. This may be omitted after greater experience.

For venous angiocardiology, the needle is placed in either external jugular vein, pointing toward the heart. Although extravascular injection of this contrast medium is innocuous, it should be guarded against for obvious reasons. The prescribed amount of material is then completely injected within two seconds. Either

one half second after, or simultaneous with, termination of the injection, the radiograph is taken. The needle is then withdrawn and the vein compressed to prevent hematoma formation. Angiocardiology taken with this technique are illustrated (fig. 1, 2).

For arterial angiocardiology, the needle is removed from the syringe and introduced into the thorax at the left seventh intercostal space about 2 cm. caudal to the apex beat and approximately one third of the ventrodorsal distance from the sternum. It is directed medially and cephalically toward the caudal surface of the heart until the cardiac pulsation is felt against the needle tip. A quick 1-cm. thrust is given and bright red arterial blood will be forcefully ejected from the needle. Occasionally, two thrusts may be required before the needle enters the left ventricular lumen. The syringe containing the contrast medium is then attached to the needle and the injection is made as with the venous technique.

With arterial angiocardiology, the radiograph exposure is made simultaneous with, or just preceding, the termination of the injection. The needle is quickly withdrawn since the animal may jerk and gasp when the contrast medium enters the cerebral circulation. Angiocardiology taken with this technique are illustrated (fig. 3, 4). Either venous or arterial angiocardiology may be repeated after a 15-minute interval.

**Variations.**—In addition to separate venous and arterial angiocardiology, it is possible to outline both right and left sides of the heart and great vessels with one injection. This method necessitates laying the animal on two x-ray plates, injecting the medium into the jugular vein, and taking the first radiograph immediately after the termination of the injection, as previously described. Then the exposed plate is pulled quickly from beneath the animal and the second x-ray plate is exposed.

At the time of the first exposure, the contrast medium is in the right side of the heart; during the second exposure, the medium has traversed the lung fields and returned to the left side of the heart through the pulmonary veins. Although some medium remains in the right side of the heart and that which enters the left is less concentrated, quite adequate visualiza-



Fig. 1—Venous angiogram in a Bassett Hound, 8 weeks old, with severe valvular pulmonic stenosis and marked poststenotic main pulmonary artery dilatation. This view is slightly left-dorsal oblique.

Fig. 2—Venous angiogram in a Beagle, 6 months old, showing pulmonic valvular stenosis with extremely narrowed pulmonic valve (between main pulmonary artery and right ventricle) and post-stenotic main pulmonary artery dilatation.

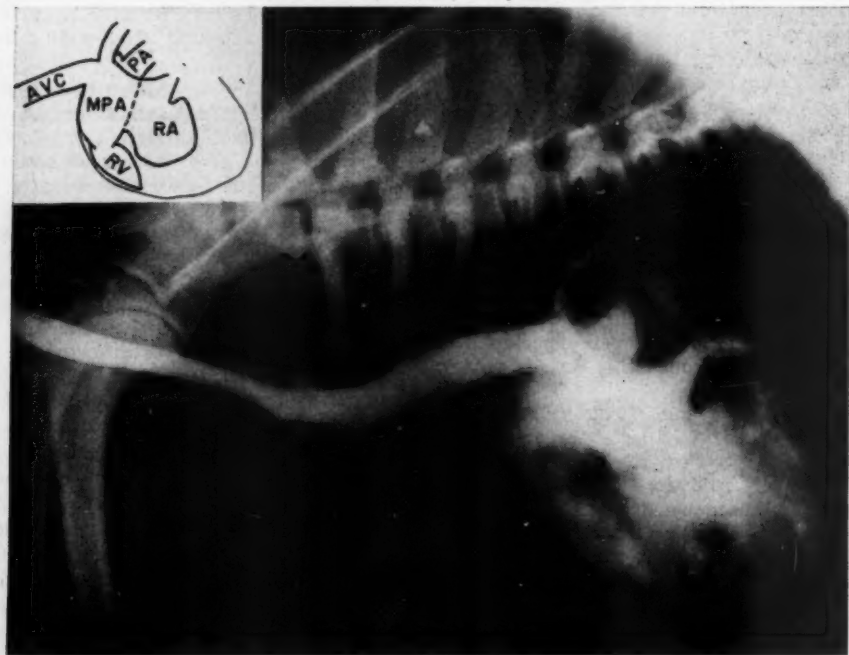




Fig. 3—Arterial angiocardigram in a normal mature dog following injection of medium into the left ventricle with excellent opacification of left ventricle, aorta, and coronary arteries.

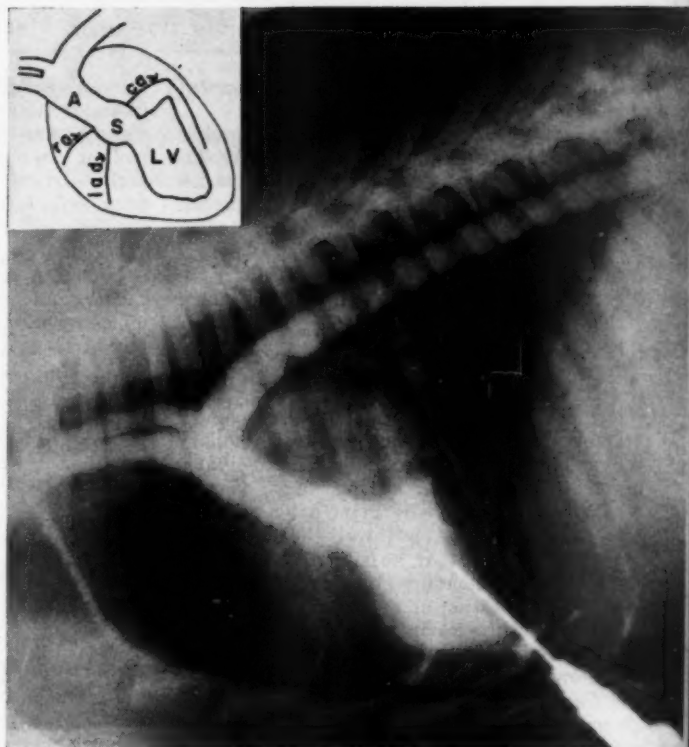
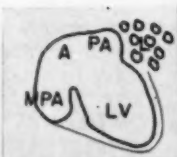


Fig. 4—Arterial angiocardigram in a Cocker Spaniel, 8 weeks old, with patent ductus arteriosus, showing contrast medium being injected into the left ventricle and also filling the pulmonary system but not the right ventricle. The medium shunted through the patent ductus. Right ventricle is between the opacified left ventricle and main pulmonary artery.



Venous (fig. 1, 2) and arterial (fig. 3, 4) angiocardigrams viewing the left side of the thorax, with top of each radiograph being dorsal and left of radiograph cephalic. Schematic representation is shown at the upper left of actual radiograph with the opacified chambers circumscribed by a heavy line and labeled: A—aorta; S—Valsalva sinuses; LV—left ventricle; LA—left atrium; VA—vena azygos; L—lung field; ca—circumflex coronary artery; ra—right coronary artery; MPA—main pulmonary artery; PA—right and left, or both, pulmonary arteries; RV—right ventricle; RA—right atrium; AVC—anterior vena cava; PVC—posterior vena cava; lad—left anterior descending coronary artery.

tion of the left side of the heart and aorta is obtained.

A second variation consists of injecting the contrast medium directly into the lumen of the right ventricle. The site of injection is at the left second intercostal space immediately dorsal to the sternal border. The area is made accessible by extending the left forelimb. The needle is directed caudally, dorsally, and medially until the cardiac pulsation is felt through the needle. A 1-cm. thrust is then given and the right ventricular lumen will be entered.

In some cases, particularly with pulmonary stenosis with poststenotic pulmonary artery dilatation, the main pulmonary artery may be entered. This is unavoidable and will require a second, more ventral cardiac puncture. The principal advantage to this method of outlining the right side of the heart is that no superimposition of the venae cavae and right atrium interferes with visualization of the pulmonary artery.

Many other variations are conceivable, but they are beyond the scope of this introductory paper.

**Complications.**—Although textbooks describing angiocardiology in man mention many adverse side effects, in our experience no serious complication was encountered in many normal and pathological animal studies. Venous angiocardiology is characterized by no side effects. Using the arterial method, we have observed transient apnea, premature ventricular beats, transient cardiac arrest, cardiac tamponade from intrapericardial hemorrhage, hypotension, hyperpnea, and transient vestibular irritation resulting in deviation of the head to either side. We have had no fatalities and nothing but transient adverse physical signs following angiocardiology.

Other reported effects include pneumothorax, hemothorax, and death by either cardiac arrest or ventricular fibrillation. When we had inadvertently injected contrast medium into either the pericardial sac or intrapleural spaces, no deleterious effects were observed.

#### SUMMARY

This paper describes a simple and safe clinical procedure for outlining the chambers of the heart and the great vessels with radiopaque contrast medium. Diatrizoic acid (90%), 1 cc. per 3 or 4 lb. of body weight, is rapidly injected into the jugular

vein or directly into the left ventricle. A lateral radiograph of the thorax is taken simultaneously with completion of the injection. An outline is obtained of either the right atrium, right ventricle, and pulmonary artery following venous injection, or the left ventricle and aorta following left ventricular injection.

Such a radiograph is termed an angiocardigram, and is useful in the diagnosis of congenital heart disease, heartworms, and atrioventricular valvular insufficiency.

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#### *Escherichia coli* Infection in Lambs

In a flock of sheep in England, containing 185 lambs, 20 made little or no attempt to suck although they appeared normal at birth. All died in two or three days. The 2 necropsied showed a purulent meningoencephalitis and 1 had signs of generalized infection with fibrinopurulent arthritis.

The *Esch. coli*, isolated from both lambs, was rapidly lethal for rabbits when injected intravenously, but caused only brief fever in 4 lambs, 3 months old. The latter may have developed immunity.—S. Terlecki and W. B. Shaw in *Vet. Rec.* (March 7, 1959): 181.

#### Liver Flukes in Laboratory Animals

*Fasciola hepatica* caused the death of 26 of 27 guinea pigs and all of 5 rabbits involved at the Department of Veterinary Hygiene in Lodz. The source of the infection was hay. Other infectious diseases were excluded.—S. Golebiowski in *Med. Wtryn.* (April, 1959): 210.

#### Hyaluronic Acid in Streptococci

Strains of streptococci which formed large amounts of hyaluronic acid in broth cultures produced infections in normal mice; strains which produced little hyaluronic acid did not.—*Vet. Bull.* (April, 1959): Item 922.

# Salmonella dublin Infection in Calves—A Preliminary Report

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A REVIEW of the literature indicates that reports of outbreaks of salmonellosis in cattle are rather infrequent in the United States.<sup>2,6,13</sup> Reports of infections involving *Salmonella dublin* in this country are even more infrequent.<sup>2,6,11,13</sup>

In 1929, *S. dublin* was differentiated from *Salmonella enteritidis* (Gartner's bacillus), serologically, and was established as an independent species.<sup>6,12,19</sup> Since then, it has been found to have world-wide distribution.<sup>6,12,19</sup>

Reports of *S. dublin* isolated from animals in the United States have been rare, with most cultures found in cattle and foxes, and before 1948, no cases had been reported east of the Rocky Mountains.<sup>2,6,10</sup> Since that time, however, a few isolated cases have been found in other parts of the United States.<sup>5</sup> In 1949, of 13,516 *Salmonella* cultures examined, from all species of animals, only 55 (0.4%) were identified as *S. dublin*. Only ten were from cattle and these were from California.<sup>2</sup>

In contrast, *S. dublin* has been held responsible for severe outbreaks of paratyphoid in cattle, particularly in calves, in many parts of the world.<sup>8,11,12,20</sup> In South Africa, 95 per cent of all calf paratyphoid has been attributed to *S. dublin*.<sup>11</sup> In Wales, in a study mostly in adult cattle, *S. dublin* was found to be responsible for 66 cases of paratyphoid and *Salmonella typhimurium* for only 4.<sup>8</sup> In Europe, this disease is common.<sup>19</sup> *Salmonella dublin* may be endemic in northern South America (Venezuela) and in Central America (Guatemala).<sup>5</sup>

In common with most *Salmonella* organisms, *S. dublin* has been found to occur most often in the young individual.<sup>1,12</sup> However, reports of infections in adult animals have not been infrequent.<sup>8,9,14</sup>

According to foreign literature, *S. dublin* frequently has been transmitted

to man through contaminated milk and meat,<sup>3,12,15,20</sup> and has been incriminated in serious epidemics of enteric type fever.<sup>3,17</sup> Meningitis and cholecystitis in man also have been attributed to *S. dublin*.<sup>19</sup>

The isolations in man, in common with those in animals, have been made primarily in other parts of the world. Only 1 case was reported in man in this country.<sup>6\*</sup> To date, *S. dublin* has not been isolated from man at the Arizona State Public Health Laboratory.<sup>4</sup>

This is a report of an outbreak of *S. dublin* in calves in a dairy herd in Arizona.

## MATERIALS AND METHODS

In necropsy of the calves, standard methods were followed. Tissues for sectioning were placed in a 10 per cent formalin solution. Paraffin blocks were prepared and sectioned. Staining was by the standard hematoxylin-eosin method.

Standard procedures for the isolation and identification of enteric bacteria were used.<sup>7</sup> Carbohydrate reactions were observed in tubes of phenol red broth base with 0.5 per cent carbohydrate added. As fermentation tubes were not used, report of gas production was based on the observation of bubbles of gas in the medium. Indol production was determined in a tryptone broth medium containing nutrient broth and 1.0 per cent tryptone. A 24-hour culture in this medium was tested with Kovac's reagent. Citrate utilization was determined on Simmons citrate medium. Hydrogen sulfide production was determined on triple sugar iron (TSI) agar.

Tissue samples collected from the calves at necropsy were incubated overnight in selenite broth. Plating from the broth was done on SS agar and colorless colonies were then picked and transferred to TSI agar slants. Where possible, a minimum of four colonies was picked from each plate. Representative cultures from those showing typical *Salmonella* reactions were selected for biochemical study. Tissue samples from calf A were liver, prescapular lymph nodes, and mesenteric lymph nodes; from calf B, liver, bile, prescapular lymph nodes, and mesenteric lymph nodes.

Dr. Rokey is associate pathologist in charge of the Animal Pathology Laboratory, and Mr. Erling is research associate, University of Arizona Experiment Station, Mesa.

The authors thank Dr. H. G. Creelius, Arizona Public Health Laboratories, Phoenix, and P. R. Edwards, U.S. Public Health Service, Chamblee, Ga., for group typing and final identification of cultures.

Arizona Agricultural Experiment Station technical paper No. 529.

\*Since this manuscript was written, there have been 11 laboratory-proved and 19 suspected cases of *S. dublin* in man in Los Angeles County since Nov. 3, 1958 (Dr. A. C. Hollister, Jr., California State Dept. of Pub. Health, Morbidity and Mortality Weekly Rep., Pub. Health Serv. (Jan. 3, 1959): 2); and also a case of *S. dublin* in man in Arizona (personal communication, Dr. H. G. Creelius, Arizona Pub. Health Labs., April 14, 1959).

## CASE HISTORY

On April 26, 1958, 2 Holstein-Friesian calves, 21 days old, were presented to the laboratory for necropsy. The male (calf A) was dead on arrival; the female (calf B) was moribund. The attending veterinarian\* gave the following history.

General clinical signs observed were extreme dehydration, sunken eyes, extreme muscular weakness, and an uncontrollable fetid diarrhea.



Fig. 1.—Intestinal tract of calf, showing grossly enlarged mesenteric lymph node (arrow).

The 2 calves were from a pen of 20 in which 17 calves had been sick. Four calves with similar clinical signs had died. In previous years, there had also been a high mortality in calves with similar illness.

The dairy herd consisted of approximately 150 adult animals. The calves were fed reconstituted milk. Management and sanitation on the farm were good. Treatment with antibiotics and commercial antisera and bacterins had been of little value.

**Necropsy Findings.**—Necropsy findings were comparable in both calves. However, pathological changes were more advanced in calf B.

The respiratory organs were apparently normal except for a few petechiae on the pleura of the lungs.

There was severe gastritis and enteritis. Many deep ulcer-like erosions and petechiae were observed in the mucosa in all parts of the abomasa, but were most numerous in the pyloric area (histologically, these were erosions of the mucosa rather than ulcerations). The erosions ranged in size from

pinpoint to 3 mm. in diameter. The largest were circumscribed by almost black areas.

The walls of the intestinal tracts were thickened and edematous throughout. Large amounts of mucus were observed in the small intestines, but there was little apparent damage to the mucosa. Many diffuse ecchymoses were present in the mucosa of the large intestines. However, there was only a small amount of free blood observed in the lumen, and that only in calf B. An excess of fluid was observed in the peritoneal cavities.

One of the most striking changes was in the mesenteric lymph nodes which were enlarged approximately three to four times the normal size in such a way that the lymph node chains could have been mistaken for a loop of small intestine (fig. 1). Microscopic sections revealed this enlargement to be due to edema rather than to hyperplasia. In general, all parts of the lymphatic system showed some enlargement, but not as much as the mesenteric glands.

The livers were enlarged, friable, and had smooth rounded borders. The liver damage in the 2 calves was similar, but was more advanced in calf A. Irregularly rounded, burnished golden yellow areas of variable size were prominent over the entire surface of both livers. In some instances, these areas had coalesced to form large irregular blotches.

Microscopic examination of liver sections showed some degree of fatty infiltration of all hepatic cells. Rather uniform dilation of central veins and central portions of the sinusoids with intralobular edema were observed. Numerous pinpoint areas of focal necrosis were surrounded by epithelioid-type mononuclear cells. These lesions were not discernible on gross observation.

Only a few petechiae were seen on the kidneys. However, microscopic examination revealed large infarcts showing all stages of necrosis with connective tissue replacement of parenchyma, with some degree of hyperemia, but little inflammatory response.

**Bacteriological Findings.**—Cultures were made from the liver and mesenteric lymph nodes of calf A, and from the liver, bile, mesenteric lymph nodes, and prescapular lymph nodes of calf B. All selected cultures were similar in biochemical reactions and were considered presumptive of *Salmonella*.

On TSI slants, these organisms produced

\*Dr. Elmer B. Powell, Jr., general practitioner, Scottsdale, Ariz.

an acid butt, alkaline slant, and hydrogen sulfide with only a slight production of gas. Maltose and dulcitol were fermented with production of a large quantity of gas. Dextrose, mannitol, and xylose were fermented with production of little or no gas. Lactose, saccharose, and salicin were not fermented. Indol was not produced and citrate utilization was delayed, a positive result showing only after 48 hours of incubation. The organisms were motile as determined in semisolid mediums.

A culture of the mesenteric lymph nodes of calf B was picked at random, from the seven cultures presumptive of *Salmonella*, for serotyping. This culture was typed as *S. dublin*.\*\*

#### ANIMAL INOCULATION

A 3-day-old calf was fed 30 ml. of a 24-hour broth culture of *S. dublin* in milk. Within eight hours of the feeding, the calf's temperature rose, reaching 107.1 F. on the second day. Other signs were extreme depression, sunken eyes, muscular weakness, recumbence, rapid respiration, dehydration, and an uncontrolled, blood-tinged fetid diarrhea. The calf was moribund on the afternoon of the fourth day and was killed.

Lesions were similar to those observed in calves A and B, but were somewhat less advanced. Gross enlargement of the mesenteric lymph nodes was comparable to the enlargements observed in calves A and B. Lesions in the abomasum were limited to innumerable petechiae and pinpoint areas of erosion in the mucosa.

Cultures presumptive of *Salmonella* were isolated from the blood, liver, mesenteric lymph glands, and prefemoral lymph glands. The culture of *Salmonella* obtained from the blood was serotyped and found to be *S. dublin*.†

#### DISCUSSION

A high incidence of so-called "calf-scour complex," usually of unknown cause, is encountered in dairy herds in central Arizona. A morbidity as high as 50 to 75 per cent and a herd mortality of 30 to 50 per cent is not uncommon in calves.

An etiological study of this "calf-scour complex" and its relationship to management, sanitation, and climate was undertaken. *Salmonella dublin* was isolated in routine examinations of specimens from 2 calves presented to this laboratory. The source of infection was not determined.

The findings were similar to those of calf paratyphoid due to *S. dublin* as previously described.<sup>12</sup> However, observations not previously emphasized were gross enlargement of the mesenteric lymph nodes and severe multiple erosions of the mucosa of the walls and folds of the abomasum.

In 1916, an outbreak of infectious diarrhea of calves in California was reported<sup>16</sup> in which the etiological agent was identified as *Bacillus enteritidis*. That work was completed before *S. dublin* was established as a separate species from *S. enteritidis*. The author<sup>16</sup> called especial attention to lesions of the abomasum and grossly enlarged mesenteric lymph nodes similar to those found in the animals in this study. These changes are not mentioned in the report of the 1954 outbreak in California.<sup>18</sup>

The prevalence and apparent pathogenicity of *S. dublin* infections in other parts of the world indicate the potential danger of *S. dublin* should it become endemic in this country. In 1948, one authority<sup>6</sup> stated, "Since *S. dublin* is a partially host adapted type capable of causing an extremely destructive disease of cattle and of producing severe outbreaks of infection in man, livestock sanitary officers and public health officers should take every possible precaution to prevent its spread in this country."

#### SUMMARY AND CONCLUSIONS

1) *Salmonella dublin*, rarely reported in this country, was isolated from a 3-week-old calf from a large dairy herd in which a mortality of 33 per cent and morbidity of 85 per cent was reported in the young calves.

2) Outstanding lesions observed at necropsy were grossly enlarged mesenteric lymph nodes and multiple erosions of the mucosa of the walls and folds of the abomasum.

3) Clinical signs and lesions observed in the naturally infected calves were reproduced in an experimental calf by feeding a broth culture of *S. dublin*; a pure culture

\*\*Group typing, Arizona State Public Health Laboratory, Phoenix; final typing, Communicable Disease Center, Chamblee, Ga.

†Communicable Disease Center, Chamblee, Ga.



of the organism was isolated from the blood of this calf.

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- posure to 40,000 roentgens from an x-ray source.
- The vaccine was administered orally to three groups of calves in two doses with a six-week interval between; all calves were given 1,000 larvae as the first dose and 4,000, 2,000, and 1,000, respectively, as the second dose. All of the vaccinated calves were completely resistant to infection when challenged with 10,000 normal larvae.
- The vaccine was used in a large-scale field trial and has led to the introduction commercially of the first vaccine against a parasitic disease.—[W. F. H. Jarrett, F. W. Jennings, W. I. M. McIntyre, W. Mulligan, N. C. C. Sharp, and G. M. Urquhart: Immunological Studies on *Dictyocaulus Viviparus* Infection in Calves—Double Vaccination with Irradiated Larvae. *Am. J. Vet. Res.*, 20, (May, 1959): 522-526.]

### Shipping Fever Not Induced with *Pasteurella*

Sixteen calves were exposed to *Pasteurella multocida* and *Past. hemolytica* by several different routes with more than one route in most animals. The intratracheal and subcutaneous routes were used most frequently. Cortisone and stilbestrol were used as stressing agents in some of the calves.

No illness was observed, nor any lesions found at necropsy. The stressing agents did not alter the resistance of animals to challenge. Virulence titrations in mice showed that *Past. multocida* strains varied in virulence while *Past. hemolytica* was found to be relatively nonpathogenic.—[C. Gale and H. R. Smith: Studies on Shipping Fever of Cattle. I. The Experimental Exposure of Cattle with Various Cultures of *Pasteurella*. *Am. J. Vet. Res.*, 19, (Oct., 1958): 815-817.]

### Influence of Hormones on Lactation

The stimulus from milking, or from sucking, was found to result in the liberation of oxytocin from the rear lobe of the hypophysis. This hormone caused the "myo-epithelial cells" (basket cells), at the base of the secreting cells, to contract and press the pre-formed milk into the alveolar lumen. This reflex activity is influenced by psychic factors.—*Prakt. Tierarzt* (Feb. 1, 1959): 59.

### Vaccinating Calves for Lungworms

A method of artificially immunizing calves against infection with *Dictyocaulus viviparus*, the bovine lungworm, is described. The vaccine consisted of third-stage larvae, partially inactivated by ex-



# The Prevalence of Rabies in Populations of Foxes in the Southern States

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THE RESULTS presented here are part of an ecological study of foxes, and concern the prevalence of rabies in certain populations. Since the maintenance of rabies is dependent upon contact between infective and susceptible animals, the spread and intensity of the disease is dependent in part on their numbers and movement. This paper reports the prevalence in relation to a measure of populations of foxes, that reflects the frequency with which contacts might occur.

Sylvatic rabies was first reported in Georgia, in 1940, and in Florida, in 1942, though it was recognized in the dog population of these states for many years prior to that. In Georgia, rabies is an important public health problem. It has been reported in 119 of the 159 counties in the state and has become enzootic in certain regions.<sup>2</sup> Since its discovery, over 1,400 rabid foxes have been examined in the state laboratory. In Florida, rabies has been less spectacular in terms of numbers of reported cases, but appreciable numbers of raccoons and bats in addition to foxes have been incriminated.

An interesting feature is the failure to detect rabies in the raccoons of Georgia and the mainland of Florida although the disease is common among the raccoons of the Florida peninsula.<sup>2</sup>

In this study, foxes from 15 counties in Georgia, six counties in Florida, and one in South Carolina were examined. In 16 of these counties, sylvatic rabies has been reported for at least nine years and in one for six years. The remaining five counties

have either reported the disease for too few years to determine its trend or have not reported its presence.

Four counties (table 1) have reported the disease in at least half of the years since its discovery, and hence are here considered enzootic. Six counties reported rabies in more than one third but less than one half of the years since its discovery. The remaining counties with sufficient history to judge are regarded as epizootic since rabies was reported in one third or less of the years since its discovery, and all counties show a span of five years or more in which the disease was unreported.

TABLE 1.—Occurrence of Sylvatic Rabies from the Time of Its Discovery in Animals in a County to January, 1957

County	Year first recorded	Years of recurrence	Years since discovery	Percentage of years occurring
<i>Georgia</i>				
Jackson	1954	2	2	*
Bacon	1946	2	10	20
Grady	1947	2	9	22
Wayne	1946	2	10	20
Putnam	1947	4	9	45
Newton	1949	4	9	45
Ben Hill	1944	4	12	33
Coffee	1944	4	12	33
Thomas	1940	4	16	25
Colquitt	1945	4	11	36
Ft. Benning	1944	5	12	42
Ware	1945	5	11	46
Mitchell	1946	5	10	50
Crisp	1944	6	12	50
Decatur	1946	8	10	80
<i>Florida</i>				
Jackson	1951	4	6	67
Jefferson	1947	3	9	33
Marion	1954	2	3	*
Washington	1954	2	3	*
Leon	1948	3	8	38

\*Insufficient number of years for calculation.

## MATERIALS AND METHODS

The field studies and collections were conducted in 22 counties of Georgia, Florida, and South Carolina during 1953 to 1957. The areas studied were selected on the basis of reports of confirmed rabies, collected from enzootic, epizootic, and rabies-free areas. Trapping in these areas provided estimates of the number of foxes. The routine was to select five or more primitive roads 1 mile long, or longer, in the area and to use traps along these roads for seven days. The traps were spaced at

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The authors are indebted also to Drs. L. E. Starr and J. E. Scatterday, public health veterinarians of the state of Georgia and Florida, respectively, for providing historical records, laboratory reports, and assisting with the diagnostic work. The laboratory work was done under the direction of Dr. Ernest Tierkel of the U.S. Public Health Service.

TABLE 2—Relation of Abundance of Foxes to Prevalence of Rabies in Foxes

County	Stage of epidemic	Trapping date	Stations**		Foxes examined	Foxes rabid (%)
			(No.)	(%)		
Crisp	Early	Jan. 1954	41	46.2(7.8)	28	3.5
Seminole		Feb. 1957	57	29.5(6.0)	26	3.9
Mitchell		Oct. 1955	101	24.8(5.7)	147	8.8
Washington*	Middle	Nov. 1953	31	57.1(9.0)	15	6.6
Decatur		Oct. 1955	49	31.5(6.7)	20	5.0
Jackson*		Feb. 1954	25	30.0(9.2)	6	16.7
Colquitt		Nov. 1955	95	27.6(4.5)	62	11.3
Decatur		Feb. 1957	58	16.3(4.8)	13	15.3
Marion*		Jan. 1955	69	14.8(4.3)	12	0
Fort Benning	Late	Oct. 1954	70	10.0(3.6)	301	1.9
Jackson		Jan. 1956	50	40.1(6.9)	25	0
Ben Hill		Jan. 1956	47	34.4(6.8)	25	4.0
Wayne		Jan. 1957	52	31.2(6.4)	22	0
Newton		Jan. 1954	31	30.2(8.3)	9	0
Crisp		Dec. 1956	56	29.3(6.4)	32	0
Jackson*		Jan. 1956	69	27.3(4.7)	20	0
Ware		Nov. 1956	54	25.7(5.9)	19	0
Grady		Jan. 1956	159	23.0(3.3)	44	0
Coffee		Oct. 1956	54	19.7(5.4)	14	0
Bacon		Jan. 1957	57	14.6(4.7)	12	0
Crisp		Dec. 1955	65	13.3(4.2)	18	0
Thomas		Jan. 1956	127	10.6(2.8)	85	0
Putnam		Jan. 1955	39	10.0(4.8)	3	33.3
Ben Hill		May 1956	35	6.1(4.0)	10	0

\*Counties of Florida—all other counties of Georgia; \*\*the percentage of stations that trapped foxes (the numbers in parentheses are standard deviations).

0.2-mile intervals and a daily record of each station's performance was maintained.<sup>3</sup>

The data collected are here presented as the percentage of stations that caught 1 or more foxes.<sup>3</sup> Thus a line consisting of ten stations, six of which caught 1 or more foxes, would have a percentage of 60. This method reflects both number and movement of foxes. However, within a season the method gives consistent results and can be used to compare numbers on the assumption that movements within a season are essentially the same in various places.

Although foxes, both gray (*Urocyon cinereoargenteus*) and red (*Vulpes fulva*), are the major wildlife species incriminated, all wild species taken in the traps were prepared for laboratory testing, and in several counties, additional sampling was continued after the initial efforts. The heads were removed in a manner that did not damage or contaminate the submaxillary salivary glands.<sup>4</sup> The specimen was then numbered, placed in a plastic bag, and kept in cold storage until it reached the Communicable Disease Center Laboratory at Newton, Ga.

At the laboratory, a sample of brain tissue and the salivary glands were removed, ground separately in a mortar with diluent, and the suspensions were centrifuged. Antibiotics were added to the supernatant fluid to control contamination. Mice were inoculated and checked daily for 21 days for signs of rabies. Brain smears of all inoculated mice which died were prepared, using Sellers' stain, and examined microscopically. The presence of Negri bodies verified the presence of rabies virus. In doubtful cases, second passages of brain tissue were made. Part of the original brain tissue of each fox was frozen and retained at -50 to -70 C. for future reference.

The ultimate result of this study is a comparison of the estimate of fox abundance (and movement) with the percentage of foxes positive for rabies. The first problem is to consider the stage in the epizootic that trapping began, since trapping early in the outbreak would provide few foxes positive for rabies but trapping late would provide many. The evaluation of the stage at which trapping was begun was determined by the number of reports of rabid foxes before and after trapping began. Although these reports are usually incomplete, they may be used to indicate early stage (two thirds of reports after trapping), middle stage (one third of reports after trapping), and late (few or no reports after trapping).

## RESULTS

The counties (table 2) are arranged according to the stage of the outbreak. The other columns show the percentage of stations that caught 1 or more foxes and the percentage of foxes found rabid. The three counties in which trapping was done "early" in the outbreak generally had a lower percentage of rabid animals than those listed as "middle." It is apparent that the trappers arrived too late (or that reporting failed) in many counties. These data do not indicate a correlation of abundance of foxes and prevalence of rabies.

Brain tissues and salivary glands of 2,148 animals were collected. Rabies virus was isolated from the brain tissue of 32 (3.1%) of 1,026 red and gray foxes collected. No virus was recovered from any

of the 299 raccoons (*Procyon lotor*), 215 opossums (*Didelphys marsupialis*), nor the 123 rabbits (*Sylvilagus* sp.) and rodents (*Sciurus*, *Peromyscus*, *Sigmodon*, *Reithrodontomys*). One positive bobcat, *Lynx rufus* (among the 51 from Fort Benning), was found among the 89 examined and 1 positive striped skunk (*Mephitis mephitis*) (from the 6 in Jackson County, Fla.) was reported from the 144 examined.

Of the 252 bats collected, 2 were positive, 1 seminoe bat (*Lasiurus seminolus*) taken in Thomas County, Ga., and 1 Mississippi myotis (*Myotis austroriparius*) among the 71 taken from Indian Cave, Jackson County, Fla.

In no instance was virus recovered from the salivary glands of an animal that did not have positive brain tissue. However, only 81 per cent of the "positive" foxes had virus in the salivary glands. No differences between the sexes were apparent.

#### DISCUSSION

An actual tally of the total rabid foxes in a population is impossible since the disease cannot be detected in the early incubation stages nor can all of the animals be examined. An index to the prevalence of rabies can be estimated, however, from the proportion of those examined that show evidence of rabies virus.

Whether a trap will capture rabid and normal animals with equal efficiency is not known. However, foxes in various stages of the disease can be taken in traps. During this study, 32 rabid foxes were trapped in 11 of the 24 separate periods (table 2). The fox, both gray and red, has been reported to hunt and eat normally even when the disease has progressed to the stage where virus is present in the brain and salivary glands.<sup>1</sup> This was confirmed in several instances in this study.

Some of the foxes examined and considered negative for rabies might have been incubating the virus. The sampling procedure underestimates the prevalence of rabies because the disease cannot be diagnosed in the initial stages, and animals in the terminal stages are rarely trapped. Since the total number of days in these two phases is small, the underestimation is perhaps only 0.5 per cent of the infected animals. The error would be somewhat constant among areas.

The reported occurrence of rabies in various counties was compared with the

prevalence found in the foxes collected in those counties. (Since the general prevalence was low, sampling errors would produce great variability.)

In seven collections from four counties that had not reported rabies for at least five years, no virus was recovered from any of the 133 foxes or 114 animals of other species.

Of the 24 counties that reported the disease present at the time of trapping, in only 11 were 1 or more rabid foxes trapped. In two of the 13 counties in which no rabid animal was taken, rabid foxes were reported during the three-month period following the census. Obviously, the failure to capture a rabid fox does not mean that rabies is absent in an area, but it indicates that the prevalence is too low to be detected in small samples.

Since rabies is transmitted by contact, a threshold of density of animals for the occurrence of rabies might be discovered. The data for the counties in which rabid foxes were caught showed that  $28.9 \pm 3.64$  per cent of the trap stations caught foxes, significantly higher than the  $22.0 \pm 2.78$  per cent for the counties in which no rabid foxes were caught. When only the initial census in a county is considered, the first value is  $32.3 \pm 4.04$  and the second is  $22.5 \pm 3.36$  per cent.

Examination of a sufficient number of foxes to permit detection of rabies would require expenditure of much time and money. Therefore, it appears that the current reporting system, in spite of its deficiencies, will continue to be used.

It is also apparent from table 2 that trapping on this scale does not permit prediction that a county has passed the threshold for occurrence of rabies. Counties may have a high percentage of stations that catch foxes but little rabies. Obviously, the occurrence of an epizootic of rabies depends upon many factors in addition to the number of foxes.

#### SUMMARY

An ecological study of foxes in Georgia and Florida from 1952 to 1957 permitted examination of wild animals for presence of rabies.

Foxes were caught in 22 counties. The heads and salivary tissues were examined by the mouse-inoculation test. Many of these counties had reports (laboratory-

confirmed cases) of rabies for several years.

Rabies virus was isolated from brain tissue of 32 (3.1%) of 1,026 red and gray foxes. No virus was recovered from any of 133 foxes in four counties that had not reported the disease for at least five years. Virus was recovered from foxes in only 11 out of 24 collections from counties in which rabid foxes were currently reported.

Counties that reported rabid foxes had somewhat higher populations of foxes than did other counties.

Examining a small sample of foxes is not a satisfactory means for detection of rabies.

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### Bats Did Not Spread Rabies in Germany

Of 92 normal insectivorous bats examined for rabies virus, none showed brain changes but the virus was neutralized by the serums of 8.

Of 15 bats inoculated intracerebrally with 200 I.D.<sub>50</sub> of street virus, 12 developed rabies but Negri bodies were found in only 1, and the virus was isolated from the salivary gland of only 1 of 11.

Of 14 bats inoculated intramuscularly, only 2 developed rabies. None of 60 mice bitten by infected bats developed rabies.

Bats may act as a reservoir, but seem not to spread rabies in Europe.—*Vet. Bull. (April, 1959): Item 1050.*

### Unusual Behavior of Rabid Foxes

A bird dog in Arkansas was on point when attacked by a fox. The bird hunters were only about 50 yards away when the incident took place and saw the fox emerge from the brush behind the dog. The fox seized the dog's tail in his mouth and had to be killed and pried loose.

Since the dog had been previously vaccinated with chicken embryo, rabies vac-

cine, he was given booster injections and put under observation. The state laboratory reported that the fox was infected with rabies.

Another unusual incident in Arkansas involved an aged Negro who was en route to visit a neighbor about one half mile from his home. While he was resting on a stump in the woods, a fox came out of the underbrush, attacked him viciously and, fastening to his nose and upper lip, refused to let go until choked to death. The man was given Pasteur treatment. The fox was found to be rabid.—*Morbidity and Mortality Report, March 13, 1959.*

### The Mechanism of Salt Poisoning

Death following ingestion of large quantities of salt can be produced in animals only during periods of concurrent water deprivation. It is proposed that ingestion of an excess of salt is followed by its rapid absorption from the intestine, a marked increase in the osmotic pressure of the blood, movement of water from interstitial spaces into the plasma, and a concurrent diffusion of the salt into the interstitial spaces of the body tissues. The increased NaCl content of the extracellular fluid, in turn, causes a flow of water out of the cells, the final result being a uniform increase in electrolyte concentration and osmotic pressure in body fluids but a decrease in intracellular fluid, including the brain cells.

Manifestations of moderate deficit of water are limited to thirst, oliguria, and deterioration of cerebral functions. With greater intercellular hypertonicity, the cells are further dehydrated and death results from respiratory failure.

In experiments with dogs where radioactive sodium was used, only 3 per cent exchange of the sodium ion between the plasma and the extracellular space of the brain occurred in 11 minutes, 12 per cent after two hours, and equilibrium was established after 62 hours. This slow exchange probably accounts for the delay of 36 to 48 hours after ingestion of salt before pigs show signs of poisoning.

Young pigs and chicks are more sensitive to salt poisoning than the adults of these species, probably because their reserve of body water is more limited.—*W. Medway and M. R. Kare in Cornell Vet. (April, 1959): 241.*

## Toxicity of *Drymaria arenarioides* for Cattle, Sheep, and Goats

J. W. DOLLAHITE, D.V.M.

Marfa, Texas

RANCHMEN IN the state of Chihuahua, Mexico, have suspected for a number of years that alfombrilla, a small weed, is poisonous to livestock. Recently, it was reported to be the cause of death of cattle in the northern part of that state. Total losses for 1955 and 1956 have been estimated at 3,000 head.

In August, 1956, 600 steers were shipped to Juarez for export to the United States. They were held in a region where the weed was abundant and the cattle had grazed on it for several hours prior to being placed on the train for Juarez. After the 12-hour train trip, many of the steers were sick and more than 100 were dead when they were unloaded.\* The sick animals were nervous, starry-eyed, trembling, and had muscular spasms and convulsions.

A specimen of the plant, alfombrilla, was brought to the Marfa laboratory, then forwarded to Texas A. & M. College, where it was identified as a species of *Drymaria*.\*\*

and was verified at the U.S. Department of Agriculture, Washington, D.C.

### BOTANICAL DESCRIPTION AND DISTRIBUTION\*\*

*Drymaria arenarioides*<sup>3</sup> (fig. 1 to 3) is a prostrate, glandular-puberulent, short-lived perennial with profusely branched stems 3.0 to 20.0 cm. long; leaves more or less fascicled, linear-lanceolate to narrowly elliptic, 1.0 to 2.5 mm. wide, 5.0 to 15.0 mm. long. The sepals are dissimilar, lanceolate; petals white, 5.0 to 6.5 mm. long, divided into six lobes to about the middle, the outer lobes 1.0 to 1.2 mm. wide, the inner ones filiform and shorter; capsule is ovoid 4.0 to 5.0 mm. long; seeds brown, minutely granular tessellate.

This plant is known to grow in northern Sonora and Chihuahua, Mexico, and southward into central Mexico. It is one of some 15 species of *Drymaria* that occur in northern Mexico.

Soil analysis showed that *D. arenarioides*

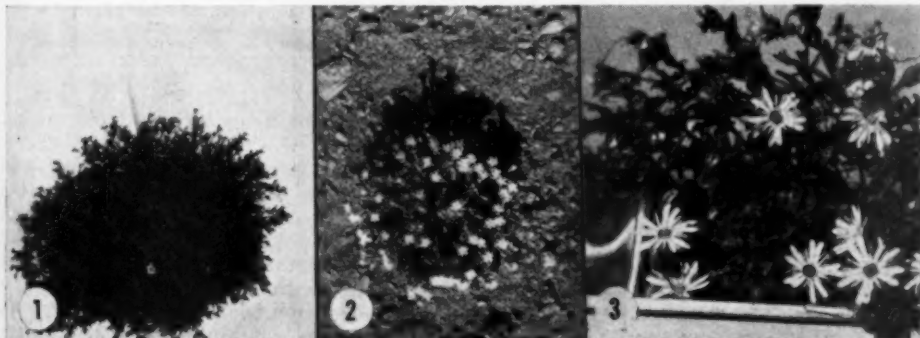


Fig. 1—*Drymaria arenarioides* (alfombrilla), a small weed poisonous to livestock.

Fig. 2—*Drymaria arenarioides* in blossom.

Fig. 3—Close-up of *Drymaria arenarioides* in blossom.

Identification of the plant as *Drymaria arenarioides* was first made at Mexico City

From Animal Disease Investigations Laboratory, Marfa, Texas.

\*Dr. Fred Major, of the U.S.D.A. Agricultural Research Service, inspected these cattle and investigated the losses.

\*\*By Dr. Frank W. Gould, curator of the Tracy Herbarium, Texas A. & M. College.

usually grows in an acid soil,<sup>1</sup> with a pH range from 5.12 to 6.76. One collection was made where the soil had a pH of 7.32. On one occasion, the transition line between acid and alkaline soils was located. *Drymaria arenarioides* was growing in profusion in acid soil within less than 50 meters



of the line and not a single plant was to be found on the alkaline side.

#### FEEDING TRIALS

The Animal Disease Investigations Laboratory obtained a sufficient quantity of this plant to conduct feeding trials.† The plant was dry and apparently rather unpalatable. It was offered, free choice, to a goat, a calf, a rabbit, and 4 guinea pigs.

The calf refused to eat the weed. The goat, which ate only 0.1 per cent of its body weight in seven days, showed mild signs of

short as two hours. Animals may have subnormal temperatures, dropping to 94 F. before death. Trembling, muscular spasms, and mild salivation occur. They show labored breathing, groan, are reluctant to move, become prostrate, and die. Occasionally tenesmus, straining, and bloating occur.

**Gross Pathology.**—Lesions are extensive. The lungs usually are congested, with small hemorrhages on the surface. Extensive hemorrhages in the endocardium and epicardium sometimes extend into the cardiac muscle. The spleen is thick, congested and

TABLE 1—Results of Feeding\* Dried *Drymaria Arenarioides* to Cattle, Sheep, and Goats

Animal	Animal weight (lb.)	Amount of weed fed (oz.)	Percentage of body weight	Results
Calf 140	103	8.0	0.48	Died between 10 and 20 hours.
Calf 130	200	8.0	0.25	Died in 18 hours.
Cow 21	790	12.8	0.10	Sick after 17 hours; recovered.
Cow 88	830	19.2	0.15	Fed 6.4 oz. per day for 3 days; died 23 hours after last feeding.
Sheep 6	89	8.0	0.56	Found dead after 17 hours.
Sheep 7	91	4.0	0.27	Sick after 18 hours; recovered.
Sheep 8	43	0.7	0.10	Found dead after 21 hours.
Sheep 2	90	2.8	0.20	Fed 1.4 oz. per day for 2 days; died.
Sheep 4	76	24.0	2.0	Fed 1.2 oz. per day for 12 days and 2.4 oz. per day for 4 days; died.
Goat 9	80	12.8	1.00	Died in 10 hours.
Goat 7	105	1.6	0.10	Mild intoxication; recovered.
Goat 5	75	6.4	0.53	Died in 22 hours.
Goat 1	95	4.0	0.26	Sick after 19 hours; recovered slowly.
Goat 11	90	4.2	0.30	Fed 1.4 oz. per day for 3 days; died 4 hours after third feeding.
Goat 3	86	5.6	0.40	Fed 1.4 oz. per day for 4 days; sick 24 hours after third feeding; died 8 hours after fourth feeding.
Goat 37	45	2.1	0.30	Fed 0.7 oz. per day for 3 days; died.

\*Most of the animals were "force-fed."

poisoning. The rabbit ate some of the plant after six days, but remained normal. Two of the 4 guinea pigs ate enough of the plant in four days to kill them. Dried *D. arenarioides* was then "force-fed" to cattle, sheep, and goats (table 1).

An 830-lb. cow died after eating 19.2 oz. of dried plant in three daily feedings (6.4 oz./day). Marked signs of poisoning were produced by feeding 12.8 oz. to a 790-lb. cow. A 45-lb. goat died after eating 2.1 oz., and 4 oz. produced signs of poisoning in a 95-lb. goat; 0.7 oz. killed a 43-lb. lamb.

#### SIGNS AND PATHOLOGICAL CHANGES

Signs of poisoning develop rapidly, and usually only a short time elapses from their onset until death. This period may be as

soft, and blood drips or runs from the cut surface.

The liver is congested and friable, and usually there are hemorrhages under the capsule. An edematous infiltration into the tissues of the walls of the gallbladder may extend down the bile ducts. Hemorrhages occur in the wall of the gallbladder. The bile varies from dark green to amber to red, and may contain blood. The kidneys usually are congested and may be surrounded by a band of semigelatinous, amber-colored fluid 6 inches wide. The abdominal cavity sometimes contains a large amount of amber-colored fluid. There is a mild gastritis and there may be mild to severe enteritis.

**Histopathology.**†—Hemorrhages are pres-

†Through the cooperation of Drs. F. G. Hamilton and Fred Major, of the U.S.D.A. Agricultural Research Service.

‡Studies made by Hilton A. Smith, head of the Department of Veterinary Pathology, School of Veterinary Medicine, A. & M. College of Texas, College Station.

ent in the myocardium. Necrosis occurs in the majority of the livers; congestion and fatty degeneration in the minority. Most of the kidneys have cloudy swelling and dilation of tubules, with some necrosis of epithelium of tubules. The spleens are congested and about 50 per cent show hemosiderin.

#### DISCUSSION

The toxic dose of *D. arenarioides* and the signs and lesions produced are similar to those reported in studies on *Drymaria pachyphylla* (inkweed).<sup>2</sup> Little is known about the palatability of the green plant except that enough is reportedly eaten by cattle in northern Mexico to cause severe losses. Nothing is known concerning the toxic principle of either *D. arenarioides* or *D. pachyphylla*.

It is interesting that of these two plants of the same genus which produce the same clinical signs and lesions when fed to animals, *D. arenarioides* prefers an acid soil and *D. pachyphylla* flourishes in an alkaline soil.

#### SUMMARY

*Drymaria arenarioides* (alfombrilla) has been reported as causing heavy losses in cattle in northern Mexico. Feeding trials at Marfa, Texas, showed it to be highly poisonous. As little as 0.1 per cent of the body weight fed to a sheep resulted in death within 21 hours. Each animal that was "force-fed" as much as 0.25 per cent of its body weight of the weed became ill, and all those forced to eat as much as 0.5 per cent died.

#### References

<sup>1</sup>Hearn, Joseph L., Tecnico Agrícola, Chihuahua, Chihuahua, Mexico: Personal communication, 1958.

<sup>2</sup>Mathews, Frank P.: The Toxicity of *Drymaria pachyphylla* for Cattle, Sheep and Goats. J.A.V.M.A., 83, (Aug., 1933): 255-260.

<sup>3</sup>Wiggins, Ira L.: The Genus *Drymaria* in and Adjacent to the Sonoran Desert. Proc. Calif. Acad. Sci., 4, (1914): 189-213.

#### Treatment for Bracken Poisoning

Several cattle with bracken fern poisoning were successfully treated with DL-batyl alcohol and antibiotics. Two animals showing hemorrhages and pyrexia were given comprehensive antibiotic therapy.

The 1 injected subcutaneously with DL-batyl alcohol (1 Gm. in olive oil) on five consecutive days recovered; the other, given olive oil alone, died after three days. Two other cattle, at the critical stage, with leukocyte counts of less than 2,500/cmm. and blood platelets less than 65,000/cmm. were similarly treated and recovered.

Similar treatments prolonged the survival time of mice given total body x-irradiation. Bone marrow damage in bracken poisoning of cattle is similar to that due to excessive irradiation.—*Austral. Vet. J.*, 34, (Dec., 1958): 439.

#### Nitrate Poisoning in Cattle

Severe, typical nitrate poisoning developed in 9 of 28 dairy cows, in Germany, after they ate mixed fodder which was visibly contaminated with fertilizer (a mixture of ammonium sulfate, calcium carbonate, ammonium nitrate, and sodium nitrate). One cow died, but 8 recovered rapidly after intravenous infusions of 1 liter of 5 per cent glucose solution to which 2 Gm. of methylene blue and 10 ml. of a combination of ephedrine and adrenaline were added.—*Vet. Bull. (Feb., 1959): Item 524.*

#### Salt Poisoning Encephalitis—Swine

Pigs fed rations containing 5.3 and 9.4 per cent of sodium chloride, with water restricted to about two and a half times the weight of dry feed, developed typical meningo-encephalitis eosinophilia. A 3 per cent sodium chloride diet produced no abnormality. The cerebral changes and perivascular lymphocytic infiltration could result from disturbed water balance; however, pronounced eosinophil infiltration is characteristic of the sodium ion injury.—*J. T. Done et al. in Vet. Rec. (Jan. 31, 1959): 92.*

#### TGE Immunity in Sows by Feeding

An attempt is under way, on a large Iowa hog farm, to immunize sows against transmissible gastroenteritis by feeding them intestines of pigs dead of TGE. The organs, which had been frozen and stored, were fed for several days about a month before farrowing time. The sows showed only a mild diarrhea. The early results seemed beneficial.—*Nat. Hog Farmer (May, 1959): 34.*

## AVMA Business is YOUR Business

At 1:30 p.m. on Aug. 21, 1959, in the Colonial Room of the Hotel Muehlebach in Kansas City, Mo., the gavel of President-Elect S. F. Scheidy will open the first session of the annual meeting of the AVMA House of Delegates. This is the legislative body which is responsible for guiding and directing the policy and activities of the Association in the best interest of the public and the profession. Late the following day, the House will adjourn, having dealt in some way with the many problems and items of business that face a medical society in a rapidly changing world.

At the Kansas City meeting, the House will consider many problems, some of which could have far-reaching effects on the profession. Sharing the tremendous work load will be other groups (Board of Governors, Executive Board, the various councils, committees, and central office staff), but the influence of the individual member is most effectively felt in the House of Delegates. It is here that his representative, acting with approximately 63 others, deals with the business of the Association.

### HOW THE HOUSE WORKS

Here is how the House will do its work. Friday afternoon, it will hear reports from its standing committees, the Executive Board, the various councils, the officers, and the staff, and will receive unfinished and new business. The new business, in the form of resolutions, may be introduced by the delegate of his own volition or on behalf of his constituent association. Each item of business and each report will be referred to a reference committee of the House for study.

The committees will work during that afternoon, much of the night, and the following morning up to 10:00 o'clock. It is during these open reference committee meetings that the non-delegate member may seek an opportunity to voice his opinions personally. He cannot gain the floor of the House, but the reference committees, at the discretion of their chairmen, will hear any AVMA member. If the reference committees need additional information to help them arrive at conclusions and recommendations, they may summon officers, Executive Board members, council members, or AVMA em-

ployees. They will hear any House member who wishes to appear before them.

When the House again meets at 10:00 a.m. on August 22, the reports of these reference committees may be disposed of in various ways; e.g., a report or recommendation can be accepted, rejected, modified, or referred to the same council, another council, the Executive Board, or a committee. In this manner, a proposed solution to a controversial issue in which you are vitally interested could meet its fate.

As elected officials representing the entire membership, the delegates should, in the discharge of their duties, combine their own wisdom and judgment with an understanding of the attitudes and wishes of the majority of their constituents.

That the House will have its critics, both in and out of the profession, is to be expected and, in a sense, desired. But the criticism is hardly fair if it comes from those promoting selfish interests, from those who did not participate in the selection of delegates, and from those who sent an uninstructed delegate to the meeting.

There is perhaps little general appreciation that the delegates and other officials must leave their practices and positions at least two days before the average convention, that they deliberate long hours in committee meetings, and that they work toward the best possible solutions and recommendations. The present structure of AVMA government, with its system of councils, executive board, and house of delegates with its reference committees, will soon be a year old, but it may take a little more time for all of its components to mesh smoothly and for the constituent associations to speak effectively through their delegates on a national level.

At the meeting of the House in Kansas City, there will be some new faces and some new problems, but the responsibilities are the same, and the doors will be open to all members. At least 60 days before the meeting, each Delegate was sent a packet containing agenda items such as resolutions and reports, and these will be supplemented during succeeding weeks as time permits. When your representative votes, will he have the advantage of knowing the wishes of his constituents, or will he have to rely on his judgment alone?

## Abstracts

### Lipids in Epithelium of Ruminant Forestomach

As a part of a histochemical study of the function of the tunica mucosa, sections from the rumen, reticulum, and omasum of 10 cattle, 2 goats, and 1 sheep were stained with Sudan black B, oil red O, and Nile blue sulfate. Unstained sections were examined by dark field, phase contrast, and polarized illumination.

Lipids stained by Sudan black B, but not by oil red O, were present as finely granular material in the cytoplasm of the stratum basale of all 13 animals, and in the stratum spinosum of all except a day-old calf. Sudan black B also stained the cell membranes. This sudanophilic material, which stained blue with Nile blue sulfate, is probably composed of phospholipids.

In 9 of the 13 animals, the stratum corneum contained large numbers of lipid droplets. The amount of lipid stained was small in a bull on an abnormal diet, an adrenalectomized heifer, and the sheep. No lipid was stained in the stratum corneum of the day-old calf. The staining characteristics and physical properties of the droplets indicated that they are predominantly triglycerides.

There is no previous report of lipids in the stratum corneum of the ruminant forestomach. It is probable that they are produced in the degenerative processes that accompany keratinization, as in the skin, and that significant quantities of lipids are continuously added to the ingesta by desquamation from the enormous surface area provided by the papillae, crests, and laminae.

Qualitative and quantitative studies of these lipids may prove to be a fruitful line of investigation for those interested in the biochemistry of ruminant digestion in health and disease.—[R. E. Habel: *The Presence of Lipids in the Epithelium of the Ruminant Forestomach*. *Am. J. Vet. Res.*, 20, (May, 1959): 437-441.]

### Ornithosis Infection in Turkeys

Ten turkeys were inoculated intratracheally with the Jo strain of ornithosis virus and cloacal, tracheal, and serum specimens taken at intervals during the following month. The cloacal and tracheal specimens were inoculated into roller tubes containing explants prepared from the avascular zone of the yolk sac of 4- or 5-day-old chicken embryos.

After two days' incubation, the coverslips bearing the explants were removed and prepared for staining with fluorescein conjugated antiserum against ornithosis virus. Observation of typical developmental forms of ornithosis stained with the fluorescent antiserum was used as the criterion of infection. Cloacal specimens of 7 of the 10 turkeys obtained three days after inoculation were positive while tracheal specimens taken at this time that were examined were negative. Tracheal specimens

from 9 of the 10 turkeys were positive at seven days. Positive tracheal or cloacal specimens had been obtained from all 10 turkeys by the seventh day. Indirect complement-fixation titers of the serums taken at seven days were no higher than 1:16 but 4 turkeys produced titers of 1:128 or better by 14 days.

The results indicate the possibility that such tissue culture and immunocytochemical tests may be more useful than the indirect complement-fixation test.—[P. Donaldson, D. E. Davis, J. R. Watkins, and S. E. Sulkin: *The Isolation and Identification of Ornithosis Infection in Turkeys by Tissue Culture and Immunocytochemical Staining*. *Am. J. Vet. Res.*, 19, (Oct., 1958): 950-954.]

### Sulfaquinoxaline in Dairy Cattle

Experiments were carried out with 59 cows to study the effect of various levels of either soluble or insoluble sulfaquinoxaline administered in the drinking water. Levels as high as 130 or 265 mg. per kilogram of body weight of the soluble material caused toxic reactions such as ataxia, muscular weakness, inappetence and, in certain cases, hematuria. Renal edema and crystals were found in the kidneys of several animals. Similar effects were observed when insoluble sulfaquinoxaline was given at levels higher than 130 mg./kg.

The palatability of the drinking water does not appear to be reduced by drug levels up to 250 mg./gal. Comparative experiments showed that sulfamethazine, sulfathiazole, and sulfabromomethazine in doses as high as 130 mg./kg. produce no signs of intoxication. Plasma levels lasting four to five hours were detected following the administration of doses as low as 15 mg./kg.

A tendency of sulfaquinoxaline to accumulate in the body during the first few days of repeated administration seems to be governed by the size of the dose. Blood urea nitrogen studies with insoluble sulfaquinoxaline revealed that even doses as high as 530 mg./kg. apparently cause no permanent kidney damage and that the functional renal efficiency is not impaired.

The authors concluded that 65 mg./kg. of the soluble material or 130 mg./kg. of insoluble sulfaquinoxaline may safely be administered orally over a period of several days.—[G. E. Brightenback, F. V. Washko, and O. H. Siegmund: *Studies on the Oral Administration of Sulfaquinoxaline in Dairy Cattle—Pharmacology and Pathology*. *Am. J. Vet. Res.*, 19, (Oct., 1958): 794-804.]

### Biochemical and Serological Separation of Vibrios

Biochemical and serological tests were employed to characterize 68 different *Vibrio* cultures from animal and human sources. Catalase, H<sub>2</sub>S production, reduction of nitrate, salt-tolerance, changes in litmus milk, and final pH of five-day thioglycolate cultures were more suitable than indole production, urease activity, gelatinase activity, growth in nutrient broth, methylene blue sensitivity, and



the cholera-red reaction for differentiating these vibrios. All *Vibrio fetus* strains of bovine, ovine, and human origin appeared to be biochemically similar and serologically related.

Members of the "related *Vibrio*" group, which appeared to be serologically related to *V. fetus*, could be distinguished from *V. fetus* by H<sub>2</sub>S production and behavior in litmus milk. Catalase-negative vibrios were serologically related to each other and were H<sub>2</sub>S-positive and salt-tolerant (3-5%). Vibrios of swine origin appeared to be serologically heterogeneous. The presence of three serological subgroups was suggested.

Vibrios were detected in swine which were serologically related to *V. fetus* strains. The possibility of swine harboring *V. fetus* microorganisms is likely.

*Vibrio comma*, *V. metschnikovii*, and four saprophytic *Vibrio* species were able to ferment carbohydrates, allowing them to be easily differentiated from vibrios found in livestock.—[L. R. DiLiello, L. J. Poelma, and J. E. Faber: *Biochemical and Serological Separation of Some Members of the Genus Vibrio*. *Am. J. Vet. Res.*, 20, (May, 1959): 532-536.]

### Shipping Fever of Cattle

Three strains of pleuropneumonia-like organisms (PPLO) were isolated from the respiratory tracts of 3 of 7 steers affected with shipping fever. Neither PPLO alone nor a combination of PPLO and *Pasteurella multocida* with or without stress was capable of producing the syndrome of shipping fever in calves. Bovine PPLO produced acid with no gas in four of 14 carbohydrates tested. They passed through Seitz sterilizing pads and Selas No. 02 filters, but were retained by Selas No. 03 filters. Hamsters, rabbits, and guinea pigs were refractory to these three strains. Antibodies against PPLO were demonstrated in turkeys four weeks after intranasal inoculation, although clinical signs of sinusitis were not apparent.—[A. H. Hamdy, C. Gale, and N. B. King: *Shipping Fever of Cattle. II. Isolation of Pleuropneumonia-like Organisms*. *Am. J. Vet. Res.*, 19, (Oct., 1958): 818-821.]

### Hematological Studies of Swine

A hematological study of normal young pigs was made and compared with previous reports. Total leukocyte and erythrocyte counts increased from birth to approximately 7 weeks of age. The ratio of neutrophils increased at the expense of lymphocytes.

Pigs experimentally infected with ascarid ova developed a mild anemia that was noticeable 32 days after infection.

Pigs immunized with rabbit-modified hog cholera vaccine without serums developed a mild leukopenia following vaccination and again following challenge with virus. A leukocytosis followed the leukopenia and existed longer in ascarid-infected animals than in the control pigs.—[Kenneth D.

Weide and M. J. Twiehaus: *Hematological Studies of Normal, Ascarid-Infected, and Hog Cholera-Vaccinated Swine*. *Am. J. Vet. Res.*, 20, (May, 1959): 562-567.]

### Age-Change Studies of Pig Ovaries

The ovaries of 38 pigs ranging from 1 day to 33 months of age were studied. When ovarian ages are judged solely on the basis of follicular components, three periods can be differentiated: (1) The total ovarian tissue was predominantly composed of parenchyma; there was a large number of primary follicles present; liquor formation did not pass Call-Exner body stage; 1 to 8 weeks old. (2) Large numbers of vesicular follicles are present; stroma still comparatively low in proportion; 3 to 7 months old. (3) There was a low proportion of follicular components, large amount of connective tissue; 8 to 33 months old.

The first age group was also characterized by lobulated ovaries, multinuclear ova, polyovular follicles, and by rapid follicular atrophy; and the second, by the appearance of the tunica albuginea.—[Robert Hadek and Robert Getty: *Age Change Studies of the Ovary of the Domesticated Pig*. *Am. J. Vet. Res.*, 20, (May, 1959): 578-584.]

## Foreign Abstracts

### Bacteriological Diagnosis of Listeriosis

A procedure for the identification of *Listeria* is described. Material from 324 animals, in Russia, was examined by five different methods of initial culture. The most efficient technique, producing *Listeria* cultures from 35 of the animals, was the inoculation of 2 to 5 ml. of a suspension of carefully ground organs into flasks of meat peptone liver broth or serum broth.

The usual technique of bacteriological examination for *Listeria* in abattoirs in the U.S.S.R. is inadequate because it does not include the necessary examination of the brain, and the preparation of a suspension of the material.

Only large quantities of carefully ground fresh tissue will give good diagnostic results.—[Yu. A. Malakhov, *Moscow Technological Inst. of the Meat and Milk Industry: The Bacteriologic Diagnosis of Listeriosis*. *Veterinariya*, 36, (Jan., 1959): 82-86.]—ROBERT E. HABEL.

### Rabies in Reindeer

Rabies occurred in 1957 in the two northern districts of the Yamalo-Nenets National Region, U.S.S.R. It was associated with mass deaths among lemmings and foxes. Herdsmen reported that the first signs appeared in reindeer 15 to 20 days after sick and dead foxes and lemmings were found. In winter and spring, reindeer suffer from a mineral deficiency and they eat lemmings.

On the first day of illness, the reindeer were rest-



less, excitable, and easily frightened. They rubbed their polls and backs as though they itched. On the second day, they pressed forward uncontrollably, became aggressive, and attacked other deer, dogs, and men. The conjunctivas were congested and pupils dilated. In two to three days, posterior paralysis developed and the animals dropped to a "dog-sitting" posture and died.

The brains of 2 deer, 8 foxes, and 2 lemmings were examined, but Negri bodies were found in only 1 animal, the species of which is not given. Inoculation tests in mice, rats, and rabbits, using tissues from these animals, were positive for the 2 deer and 6 foxes, but not for the lemmings.—[P. I. Meteleva and I. S. Rubanchik, *Yamal Agric. Exper. Sta.: Rabies in Reindeer in the Arctic. Veterinariya*, 36, (Jan., 1959): 47-48.]—ROBERT E. HABEL.

## Books and Reports

### Reproduction and Infertility

This report indicates the interdependence that exists between industry, research and, in this case, the clinician.

The subjects discussed range from the ultra-microscopic levels of cytology ("K" type cells of the corpus luteum) and chemical minutia (17 alphahydroxyprogesterone-caproate, and Sr 90) to the more difficult areas of clinical choice of agents and methods of application.

In spite of the differences in background, training, and experience of the 40 participants, the one objective was the study of factors favorable or inhibitory to the union of the sperm and ovum, to follow the fertilized ovum and its physiological complexities through gestation, and to detect, so far as possible, deleterious influences.

Papers were presented on vibriosis in sheep and cattle. The section on tumors of the genital tracts of cows was well illustrated and was based on broad clinical experience supported by a background of pathology.

While the maintenance of pregnancy has little direct usefulness in veterinary practice, there exists a comparable situation in the "failures that result from imperfect ova and sperm, embryonic death, and abortion. The physician taking part in the program found it unnecessary to resort to lay terms such as 'repeat breeders.'"

The discussions of the papers were especially valuable but not well summarized. One answer to the question relative to the use of controls was (p. 284) "Because probably we know more about them than the other fellow."

The symposium serves to stimulate constructive thinking and to guide all workers in the fields of reproduction toward a better understanding of basic and clinical data and the crystallization of thinking. If any discipline can offer new insight into the nature of heredity, metabolism, ecology, and resistance to disease, these horizons will per-

mit a multidisciplinary approach to the various problems related to reproduction.—[*Reproduction and Infertility—Third Symposium*. 273 pages; illustrated. Pergamon Press, 122 East 55th St., New York 22, N.Y. 1958. Price \$6.50.]—H. E. KINGMAN, Sr.

### Textbook of the Insemination of Cattle

Many articles have been written about artificial insemination of domestic animals. This textbook represents the first complete book concerning modern methods of the breeding of cattle. The first of the six chapters discusses the sexual organs of bulls from the anatomical, histological, and physiological point of view. One part describes the chemical and physical characteristics of semen, together with its vitality and methods of collection. Another part considers in detail the treatment, dilution, and preservation of semen before use for insemination.

The second chapter discusses the sexual organs of females, including the movement of semen, with fertilization under natural and artificial conditions, followed by a vivid discussion of the technique for artificial insemination. The third chapter gives the historical development of artificial insemination, its disadvantages, and the necessary control from the hygienic, commercial, and international standpoint.

Further chapters are devoted to the organization and daily work at the various centers and farms for collection and preservation of semen. This textbook has many good illustrations and instructive charts. It may serve as a good aid not only for the collection centers but for the practitioners as well. It is an excellent contribution to the veterinary literature.—[*Textbook of the Insemination of Cattle (Lehrbuch der Rinderbesamung)*. By Karl Eibl. 502 pages; 201 illustrations. Paul Parey, SW 61 Lindenstr 44-47, Berlin, Germany. 1959. Price \$18.00.]—F. KRAL.

### Cell and Tissue Culture

This work is well suited to its purpose of providing "an up-to-date account of the techniques and applications of tissue culture. . ." Essentially, the contents compose an outline of the field of cell and tissue culture with adequate references to provide introduction to the literature for further details. It is divided into four parts: (1) Principles of Cell Culture, (2) Preparation of Materials, (3) Special Techniques, (4) Special Applications of Cell and Tissue Culture Methods.

This book could well be used as a textbook. Much of the material is drawn from the course offered by the Tissue Culture Association since 1947. Therefore, the organization of this book has the benefit of much experience and thinking of many leaders in the field.—[*Cell and Tissue Culture*. By John Paul. 1st ed. 261 pages; 9 plates, 40 figures, and 16 tables. Williams & Wilkins Co., Baltimore, Md. 1959. Price \$7.50.]—D. P. GUSTAFSON.

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# THE NEWS

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## Highlights of the XVIth International Veterinary Congress



Dr. W. A. Hagan (left), U.S. member of the I.V.C.'s Permanent Committee, is shown receiving an Academic Award from the University of Madrid. Professor Carlos Luis de Cuenca, dean of the veterinary college there, made the presentation.



More than 50 countries were represented at the XVIth International Veterinary Congress held in Madrid, Spain, May 21-27, 1959. Registrations totaled over 2,500 of whom 1,700 were veterinarians. The United States' delegation, including veterinarians and wives, numbered over 200.

At the Opening Plenary Session, Dr. W. A. Hagan, U. S. member of the Permanent Committee of the I.V.C., represented the English-speaking nations as one of the nine spokesmen selected to address that session. He also presented a paper at the Closing Plenary Session on "The Social Mission of Veterinary Science," a topic shared with Professor Bressou of France.

Presentation and discussion of papers at the plenary (general) sessions and main section meetings of the Congress were greatly facilitated and enhanced by simultaneous translations into four official languages: Spanish, English, French, and German. Program participants from the United States were listed in the JOURNAL, June 15, 1959, p. 573.

Among the actions taken by the Congress were the election of Professor Dr. Jean Verge of France and Professor Dr. Manninger of Austria to honorary membership. A proposal to change the official title of the International Veterinary Con-

The rostrum at the opening session of the XVIth International Veterinary Congress on May 21, 1959. The speaker standing at the right is Senor A. Campano, Director General de Ganaderia.





A section of the audience at the Opening Plenary Session of the XVIIth I.V.C. Some of the people we recognize are:

First row—Dr. K.V.L. Kesteven (second from left), Food and Agricultural Organization, United Nations; Dr. Ervin Eichhorn (extreme right), FAO/U.N., Rome.

Second row—Dr. W. R. Wooldridge (second from left), member of the I.V.C.'s Permanent Committee for the British Commonwealth, United Kingdom.

Fourth row—Dr. Yakov R. Kovalenko (third from left), director, All-Union Experimental Veterinary Institute, U.S.S.R.; Dr. John G. Hardenbergh (fourth from left), secretary, U. S. Committee.

gress to "World Veterinary Congress" was adopted unanimously.

Invitations were received from four countries for the next Congress; the invitation to convene in Germany in 1963 was accepted—the first Congress having been held there in 1863. The exact dates of the XVIIth Congress (probably to be held in Hannover) have not been set but will be scheduled so as not to conflict with the AVMA Centenary meeting which also occurs in 1963.

A more complete report on actions taken by the XVIIth Congress will be published later.

### Twenty-Sixth Annual AAHA Meeting in Colorado

The twenty-sixth annual meeting of the American Animal Hospital Association was held at the City Auditorium, in Colorado Springs, May 6-9, 1959.

Newly elected officers who will serve the Association for 1959-1960 are: Drs. William K. Riddell, Los Angeles, Calif., president; Wayne H. Riser, Skokie, Ill., president-elect; Lester R. Barto, Basking Ridge, N.J., vice-president; Frank R. Booth, Elkhart, Ind., executive secretary; and Ralph E. Ruggles, Moline, Ill., treasurer.

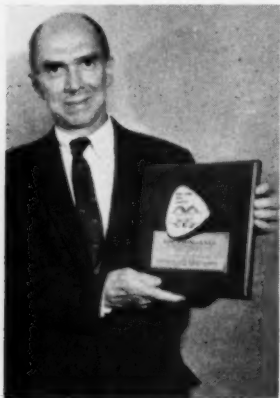
On May 6, the convention began with four preconvention seminars and workshops chairmanned by Dr. Riser. Following are the leaders and topics of each session; Drs. Wade O. Brinker, East Lansing, Mich.—orthopedic surgery; Robert L. Ticehurst, Red Bank, N.J.—neurologic diseases; William J. Zontine, Lancaster, Calif.—clinical tests; and John Micuda, Phoenix, Ariz.—hospital management.

Among the other participants in the program are: Drs. William D. Carlson, Fort Collins, Colo.—rationale of x-ray therapy; Jacques Jenny, Philadelphia, Pa.—fraction fixation techniques and repair of the acetabulum; John T. McGrath, Philadelphia, Pa.—convulsions and canine neurologic examination; Julius J. Fishler, Elkhart, Ind.—feline thoracentesis; Frank R. Booth, Elkhart, Ind.—conchal hematoma; Reginald A. Stocking, Los Angeles, Calif.—canine nephrectomy; Russell J. Beamer, College Station, Texas—urethrocolectomy in a male cat; Lewis B. Huff, Covina, Calif.—microbial sensitivity testing; Glenn A. Severin, Colorado Springs, Colo.—tattooing for solar dermatitis; Newton B. Tennille, Stillwater, Okla.—radiographic diagnosis of *Spirocerca lupi*; Jacob E. Mosier, Manhattan, Kan.—urinary infections; Wayne H. Riser, Skokie, Ill.—genitalia of the

middle-aged bitch; Alfred G. Schiller, Urbana, Ill.—intestinal anastomosis; Charles O. Seward, Bremerton, Wash.—otitis externa corrected by removal of the ear canal; and Mr. John C. Neff, American Kennel Club, N.Y.—what A.K.C. expects from the veterinarian.

#### DR. SCHNELLE RECEIVES MORRIS ANIMAL MEMORIAL FOUNDATION AWARD

Dr. Gerry B. Schnelle (UP '26), chief of staff of Angell Memorial Animal Hospital, Boston, Mass., was given the Small Animal Award of the



Dr. Gerry B. Schnelle, Boston, Mass., winner of the Morris Animal Foundation Award, is pictured with the plaque presented to him at the AAHA meeting in Colorado Springs, on May 7.

Morris Animal Foundation of Denver for his numerous contributions to the small animal field of veterinary medicine, on May 7, 1959.



Presentation of the awards at the AAHA meeting in Colorado Springs, took place on the second day of the meeting, May 7.

Left to right—Dr. James Archibald, Guelph, Ont., winner of the Gaines Veterinarian of the Year Award; Dr. John E. Gottlob, Jr., Galveston, Texas, winner of the Moss Essay Award; and Dr. Mark L. Morris, Topeka, Kan., winner of the Special Service Award.

Dr. Schnelle was cited by the Morris Foundation for conducting research on a clinical basis at Angell Hospital; for his belief that teaching and research are essential to a good animal hospital; and for his convictions that teaching benefits both the young veterinary graduate and the seasoned veterinary practitioner.

Joining the staff of Angell Memorial Hospital in 1926, Dr. Schnelle advanced until, in 1951, he was named chief of staff. He is author of a text book on radiology in 'small animal practice and of more than 100 papers in scientific veterinary publications.



Newly elected officers of the AAHA.

Left to right—Drs. William K. Riddell, Los Angeles, Calif., president; Frank R. Booth, Elkhart, Ind., executive secretary; Wayne H. Riser, Skokie, Ill., president-elect; Lester R. Barto, Basking Ridge, N.J., vice-president; Ralph E. Ruggles, Moline, Ill., treasurer.



Quebec  
Dr. Lucien Cournoyer  
(MON '48)



Rhode Island  
Dr. David E. Wyatt  
(COR '54)



Saskatchewan  
Dr. William Turnbull  
(ONT '25)

## Part IV



Tennessee  
Dr. Harry H. Morgan  
(API '43)



Texas  
Dr. Walter F. Juliff  
(TEX '46)



Utah  
Dr. Eric W. Isakson  
(ISC '43)

## Presidents of Constituent Associations



Vermont  
Dr. Donald F. Icken  
(COR '46)



Virginia  
Dr. George H. Brumble, Jr.  
(TEX '40)



Washington  
Dr. William F. Harris  
(WSC '43)



## AMONG THE STATES AND PROVINCES

### California

**Dr. Ramsay Is Honored by His City.**—Several hundred persons feted Dr. W. J. C. Ramsay at a testimonial dinner recently upon his retirement from the mayoralty. He has served the city of Watsonville as alderman or mayor for a total of 33 years.



Dr. W. J. C. Ramsay

A surprise presentation at the dinner was a portrait of himself from the Japanese citizens of the community.

Beginning his practice in Watsonville in 1908, the year he graduated from San Francisco Veterinary College, Dr. Ramsay who has a small animal hospital plans to continue in general practice.

s/MR. KENNETH HUMPHREYS, *Associate Executive Secretary to the Calif. V.M.A.*

### Delaware

**Women's Auxiliary.**—The annual spring luncheon of the Women's Auxiliary to the Delaware V.M.A. was held May 14, 1959, at the Columbus Inn, in Wilmington.

Mrs. William V. Gallery, luncheon chairman, was assisted by Mrs. Maurice W. Arnold and Mrs. Herbert A. Wolford.

s/MRS. JOHN L. WILKINS, *Publicity.*

### Florida

**Hillsboro County, First Local Women's Auxiliary Formed in State.**—The first local Women's Auxiliary in Florida was organized in Tampa as the Women's Auxiliary to the Hillsboro County Veterinary Medical Society, on Nov. 14, 1958. The constitution was ratified



Officers of the newly formed Women's Auxiliary to the Hillsboro County Veterinary Medical Society. Left to right—Mrs. W. E. Blake, president; Mrs. L. P. Murphy, vice-president; Mrs. R. G. Williams, treasurer.

in January, 1959, and includes 15 charter members.

The immediate responsibility of the group will be to prepare the women's activities at the next state convention which will be held in Tampa, in October, 1959.

Elected to serve the Auxiliary in its first year are: Mrs. W. E. Blake, president; Mrs. L. P. Murphy, vice-president; Mrs. H. P. Anderson, secretary; and Mrs. R. G. Williams, treasurer.

s/MRS. FRED JONES, *Secretary to the Women's Auxiliary of the Florida V.M.A., and Dr. M. W. EMMEL, Executive Secretary to the State V.M.A.*

**Women's Auxiliary.**—The state convention of the Women's Auxiliary to the Florida State V.M.A. was held in Fort Lauderdale on Oct. 12-14, 1958. One hundred members attended.

At the business meeting, the Auxiliary made donations of \$30 each to the veterinary libraries at the University of Georgia and at Alabama Polytechnic Institute and to the Memorial National Loan Fund of the Women's Auxiliary to the AVMA. Ten dollars was contributed to the AVMA Research Fund and \$100 was given to the library fund of the Florida Livestock Board-Laboratories Division at Kissimmee, Fla.

Officers of the Auxiliary are: Mrs. K. R. Owens, Gainesville, president; Mrs. V. L. Burns, Williston, vice-president; Mrs. Fred Jones, secretary; Mrs. P. S. Roy, Jacksonville, treasurer; and Mrs. Hoyt Hall, Tampa, member-at-large.

A special committee was appointed to help in the formation of local auxiliaries. Making up the committee are: Mrs. G. L. Lewallen, St. Petersburg, chairman; Mrs. R. P. Bixler, Fort Lauderdale; Mrs. W. F. Jackson, Lakeland; Mrs. L. R. Poe, Sanford; and Mrs. W. E. Blake, Tampa.

s/MRS. FRED JONES, *Secretary.*

## Illinois

**Dr. Buchanan Made Assistant to the Chief of the Inspection Branch.**—Dr. William S. Buchanan (CVC '10), formerly area supervisor, inspection branch, poultry division, Chicago, was appointed assistant to the chief of the poultry division's inspection branch, effective March 30, 1959.



Dr. William S. Buchanan

Dr. Buchanan has been with the Meat Inspection Service of the Bureau of Animal Industry for several years before joining the Poultry Inspection Service in 1929. He has seen this Service grow from a few inspectors to a force of over 1,200.

As assistant to the chief of the inspection branch, he will continue to be stationed in Chicago, but his duties will be national in scope. Dr. Roger E. Dodge (see below) will replace Dr. Buchanan as area supervisor.

**Dr. Dodge Succeeds Dr. Buchanan as Area Supervisor.**—Effective March 30, 1959, Dr. Roger E. Dodge (OSU '36) was assigned to the position of area supervisor in the Chicago office.

Dr. Dodge's responsibilities include the supervision of plants operating under the Poultry Products Inspection Act and the Agricultural Marketing Act, in Illinois, Indiana, Kentucky, Michigan, Missouri, Ohio, and Wisconsin.

Originally from New England, Dr. Dodge had engaged in general practice in Montana for several years. He entered the Poultry Inspection Service in 1953, and in 1955, was appointed assistant area supervisor in the



Dr. Roger E. Dodge

Philadelphia office. Dr. Dodge had been acting area supervisor there for over a year when he assumed his new position.

## Missouri

**State Association Represented on Swine Panel.**—Three members of the Missouri V.M.A. were members of a panel discussing swine diseases on the Missouri Swine Conference and Barrow Show, held at the University of Missouri, in Columbia, on March 6.

Included on the panel were: Drs. William L. Baker, Jr., Kennett; Hugh P. Callaway, Waverly; and James K. Farrell, Boonville. Dr. L. A. Rosner, Missouri Department of Agriculture, moderated the discussion.

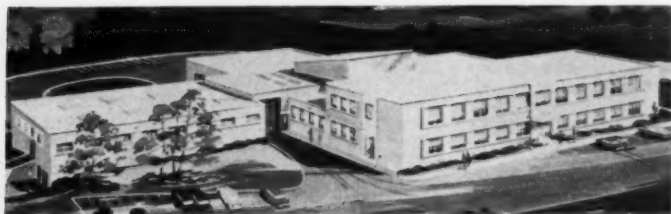
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**New Veterinary Clinic Building Approved.**—The curators of the University of Missouri have approved an architect's preliminary plans for a new veterinary clinic building, it was announced May 26, 1959, by President Elmer Ellis.

Provided by an allotment of \$800,000 from the state building bond issue, it will replace the temporary structure now in use which was obtained from government surplus following World War II.

The new clinic will be a two-story structure with over-all dimensions of approximately 204 x 270 ft., and almost 39,000 square feet of floor space. It will be east of the present temporary clinic building.

The main section will contain offices, laboratories, and classrooms. A central area between the wings will contain an auditorium. There will also be quarters for graduate



Architect's conception of the new veterinary clinic building at the University of Missouri. The main portion of the structure will be 157 x 80 ft., with a wing extending 113 ft. to the east and another wing 125 ft. south.

students and interns who are on continuous duty.

The building will be of reinforced concrete. The exterior walls will be of light, buff brick with limestone trim. Floors will be made of concrete with vinyl asbestos floor covering in offices, laboratories, waiting rooms, classrooms, and the auditorium. Air conditioning will also be installed in certain areas.

### Oregon

**State Association Meets.**—The annual winter meeting of the Oregon V.M.A. was held at the Hotel Multnomah in Portland, Feb. 6-7, 1959.

The program contributors included the following veterinarians: Drs. R. E. Koenig, Portland—radiation hazards, AAHA illustrated; C. D. Lee, Iowa State College—extension veterinarian—practitioner relationships and diagnostic laboratories; E. C. Stone, State College of Washington—tranquilizers and report of AVMA District XI representative; C. A. Bjork, Portland—PR-national level; C. L. Davis, Denver—tumors of the bovine genitalia

and bluetongue in sheep; S. J. Roberts, Cornell University—bovine sterility and leptospirosis; and J. H. Gillespie, Cornell University—distemper, infectious canine hepatitis, and recent virus infections in cattle.

Elected to serve the Oregon V.M.A. in 1959 are: Drs. D. H. Jones, Roseburg, president; R. H. Peterson, Tillamook, president-elect; and O. H. Muth, Corvallis, was re-elected secretary-treasurer.

### Washington

**State Association.**—Washington State Veterinary Medical Association will hold its annual meeting at the Desert Inn in Richland, on Aug. 31 and Sept. 1, 1959.

Highlight of the meeting will be a half-day tour through the Atomic Energy Commission's plant at Hanford. For additional information, contact Mr. Robert M. Ford, 2406 Boyer Ave., Seattle 2, executive secretary.

s/MR. ROBERT M. FORD, *Executive Secretary.*



Officers and executive board members of the Oregon V.M.A.

Seated, left to right—W. H. Steele, Portland, past-president; D. H. Jones, president; R. H. Peterson, president-elect.

Standing, left to right—R. C. Storey, Molalla, executive board member; F. G. Rankin, Salem, executive board member; O. H. Muth, secretary-treasurer.

## Wisconsin

### Second Regional Conference on Nitrofurans



Mayor Ivan L. Nestingen (center) of Madison, Wis., addressed the second regional conference on nitrofurans in veterinary medicine, in Madison on May 28, 1959. Dr. Harold Roberts (left) of Eaton Laboratories, Norwich, N.Y., and Dr. Burr W. Nussdorfer (right), Sparta, president of the Wisconsin V.M.A., are on either side of Mayor Nestingen.

Over 200 veterinarians attended this meeting which is one of a series of conferences sponsored by Eaton Laboratories in cooperation with the state and local veterinary medical associations.

## VETERINARY MILITARY SERVICE

**Recent Air Force Veterinary Spokesmen.—**  
Lieutenant Colonel Jack H. Hempy, V.C.,

U.S.A.F., chief of plans branch in the office of the surgeon general, presented a paper on "Medical Support of Ballistic Missile Weapons Systems" to the 1959 Supreme Headquarters Allied Powers Europe Medical Conference in Paris, France, April 8-10, 1959.

Composed of the senior medical representatives, the conference included 14 N.A.T.O. nations. Colonel Hempy represented the Surgeon General in the one-day presentation of Air Force medical support requirements for the new ballistic missile weapons system.

On April 27-29, Lt. Colonel Albert A. Taylor, V.C., U. S. A. F., chief of the biomedical division, directorate of life sciences, headquarters air research and development command, discussed "Bio-Logistics of Space Travel" at a meeting of the Aero Medical Association in Los Angeles, Calif. Keynote of the address was Russian rocket experiments which carried two animals side by side, one anesthetized and one unanesthetized. This permits a comparison of the data obtained by American rocket experiments using anesthetized animals and Russian experiments using unanesthetized animals.

Colonel Rowland W. Rushmore, V.C., U.S.A.F., deputy for professional services, veterinary services, in the office of the surgeon general, participated in a veterinary training conference sponsored by the Third Army, May 5-6. He reported on "Policies and Trends in the U.S. Air Force Veterinary Service."

S/ROWLAND W. RUSHMORE,  
Deputy for Professional Services.

### Air Force Symposium of Air Force Command Veterinarians



An Air Force Symposium pertaining to the recent changes in food inspection policies and procedures was held in Chicago during February, 1959. Participants in the symposium are pictured above.

First row, left to right—Captain John J. Naughton, adjutant; Major George E. Ritter, instructor; Major Buford F. Bridges, instructor; Colonel Thomas A. Ward, commandant; Lt. Colonel John J. Powell, director of training; Major Daniel W. Hubbard, instructor; Major Samuel K. Kirk, R. & D. officer; First Lieutenant Roland R. Stewart, instructor.

Second row, left to right—Lt. Colonel Harold F. Beadner; Colonel Benjamin F. Leach; Colonel William B. Snodgrass; Colonel W. M. Van Sant; Colonel John R. Nettles; Colonel Joseph H. Berger; Colonel Richard H. Jurden.

Third row, left to right—Major Gene C. Phelps; Lt. Colonel William D. Nettles; Lt. Colonel Omar G. Wernitz; Lt. Colonel Robert K. Nelson; Lt. Colonel Norbert A. Lasher; Lt. Colonel J. B. Couch.

Fourth row, left to right—Lt. Colonel Rolland O. Scott; Lt. Colonel Lloyd J. Neurauter; Lt. Colonel Claude O. Wilder; Lt. Colonel James C. McIntyre; Lt. Colonel Russell M. Madison; Lt. Colonel Robert W. Day; Lt. Colonel Edwin A. Beckom; Lt. Colonel William E. Bills.

## COMMENCEMENTS

Graduating Class, 1959, School of Veterinary Medicine, University of California

SCHOOL  
of  
VETERINARY MEDICINE  
University of California

Top row (left to right)—Jack D. Alpers, Stanley L. Baldwin, Thomas H. Banks, Glenn D. Bissell, Berend Broersma, Dale L. Brooks.

Second row—Glenn E. Brown, Eugene R. Carroll, David A. Christensen, Donald G. Coleman, Mardy E. Darian, Paul M. Deauville.

Third row—Wilson E. Doty, Ronald F. Duncan, Philip T. Durfee, Jr., Lloyd A. Freitas, Charley E. Gilmors, Patrick B. Goodwin, Norman J. Green, Darrell C. Gueulette.

Fourth row—Forrest K. Hart, Baxter Harwood, Arthur O. Hazarabedian, George N. Hill, Leroy Horning, Dean D. E. Jasper, Ronald D. Hunt, Charles W. Jenner, Richard H. Keagy, Victor F. Kondo, Robert W. Lammer.

Fifth row—Gabriele S. Levine, Kenneth R. Levine, William J. Martin, Donald E. Mattson, Richard F. McCune, Carl E. Monser, Donald G. Morgan, William R. Nisson, Martha M. Nold, Betty J. O'Connor.

Sixth row—George M. Ramsay, Kenneth W. Ramsay, Hamilton C. Redman, Leland V. Schmidt, Dale E. Shaffer, Maremaro Shibuya, Roy A. Skinner, Martin Small, Bud C. Tennant, Gordon H. Tittlemore.

**University of California.**—At the 1959 commencement exercises of the School of Veterinary Medicine, University of California, the following 50 candidates were presented for the D. V. M. degree:

Jack Darryl Alpers  
Stanley Lloyd Baldwin  
Thomas H. Banks  
Glenn D. Bissell  
Berend Broersma

Dale Lawrence Brooks  
Glenn Eldon Brown  
Eugene R. Carroll  
David Allen Christensen  
Donald Gene Coleman

Mardy Edward Darian  
Paul M. Deauville  
Wilson Eugene Doty  
Ronald Ferguson Duncan  
Philip Thaddeus Durfee, Jr.  
Lloyd Allen Freitas  
Charley Elmer Gilmore  
Patrick Bruce Goodwin  
Norman Jay Green  
Darrell Charles Gueulette  
Forrest Keith Hart

Baxter Harwood  
Arthur O. Hazarabedian  
George Neal Hill  
LeRoy Horning  
Ronald Duncan Hunt  
Charles William Jenner  
Richard Herman Keagy  
Victor F. Kondo  
Robert William Lammer  
Gabriele Sonntag Levine  
Kenneth Robert Levine



William Joseph Martin  
Donald Eugene Mattson  
Richard Frederick McCune  
Carl Edward Monser  
Donald Guy Morgan  
William Russell Nissen  
Martha Marie Nold  
Betty Jane O'Connor  
George Matthew Ramsay

Kenneth William Ramsay  
Hamilton C. Redman  
Leland Victor Schmidt  
Dale Eldon Shaffer  
Maremaro Shibuya  
Roy Anthony Skinner  
Martin Small  
Bud C. Tennant  
Gordon Hubbard Tittmore

Paul H. Draper  
James D. Erz  
John R. Evans, Jr.  
Duane E. Flack  
Francis G. Freemyer  
Ivan D. Geumlek  
Walter R. Gillespie  
Theodore W. Glascoe  
Max G. Grachl  
Kenneth E. Hansen  
Thomas A. Hawn  
Clarence Herbrandson  
Paul K. Hildebrandt  
Robert L. Hoff  
John Hal Hopson  
Edwin B. Howard  
Donald W. Hursh  
William E. Johnson  
Donald M. Keagy  
Clark L. Kelly  
Cleon V. Kimberling  
Artis E. Kline  
John C. Lee

William Livingston  
Gene E. Lomme  
Jon R. Lomme  
John L. Malmstrom  
Philip R. Mauro  
Lewis A. Miller  
E. Leo Myers  
Lloyd W. Peterson  
Herman F. Pfister  
James W. Pool  
Gordon R. Putnam  
Johnnie W. Richards  
Edgar D. Roberts  
William J. Sanders  
James G. Savoini  
Leonard D. Shott  
Albert L. Stoddard  
James A. Stunkard  
Dewey V. Sturges  
Floyd R. Sunshine  
Robert K. Vasey  
William J. Vencill  
James M. Wehrman

Malcolm F. Wharton

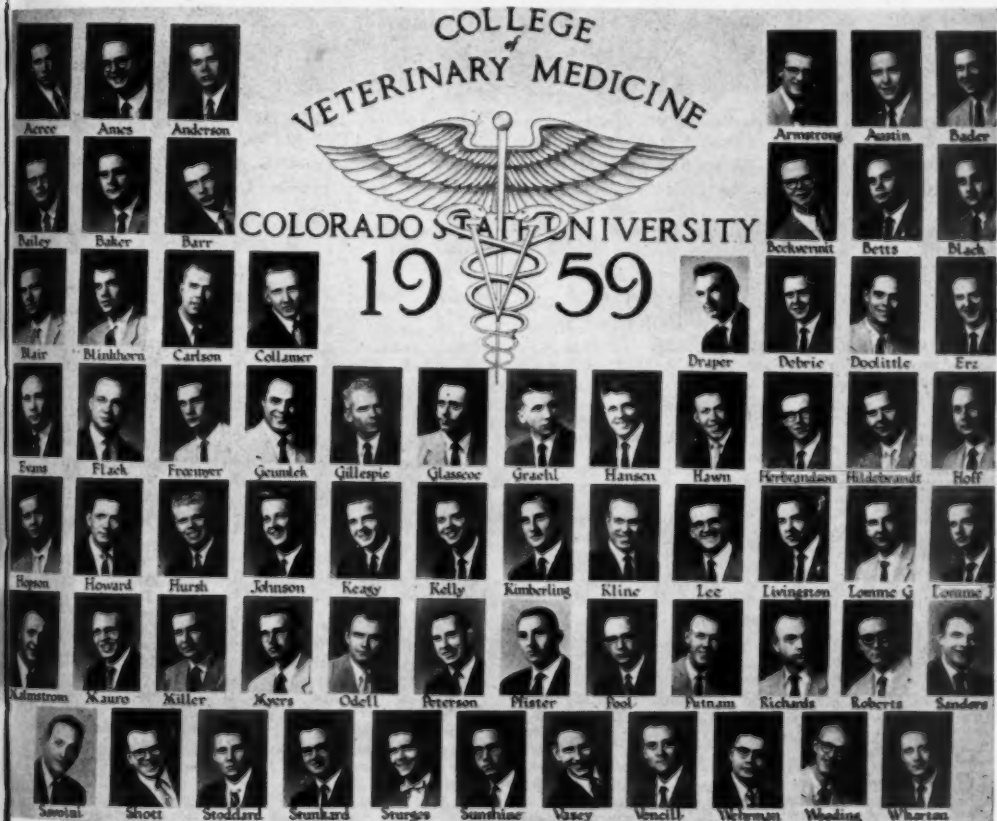
Colorado State University.—At the 1959 commencement exercises of the College of Veterinary Medicine, Colorado State University, the following 65 candidates were presented for the D. V. M. degree:

John A. Acree  
Edward R. Ames  
John D. Anderson  
Thomas C. Armstrong  
Elden R. Austin  
Charles W. Bader  
James P. Bailey  
James D. Baker  
William E. Barr

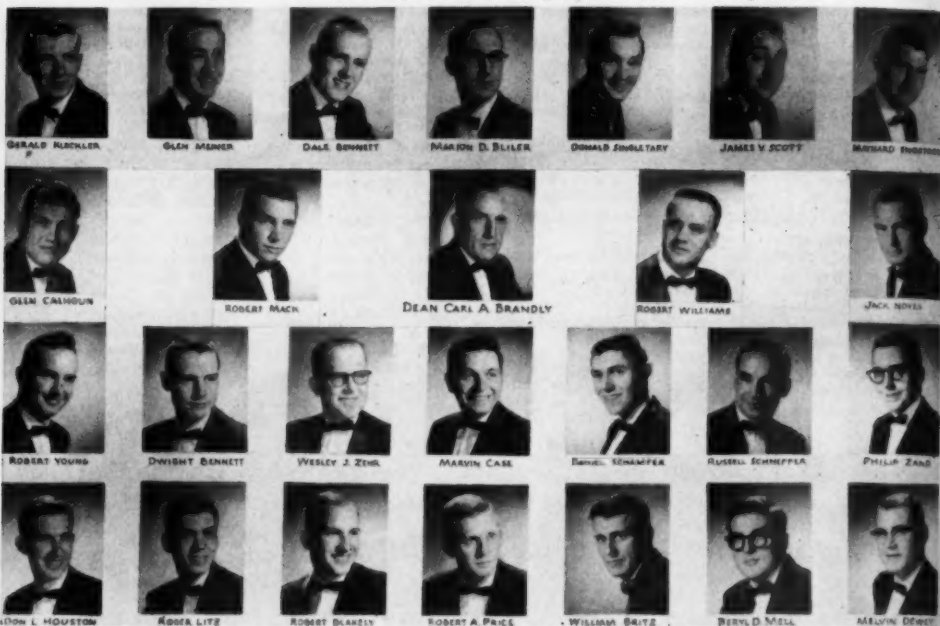
George L. Beckvermit  
Robert W. Betts  
Frank L. Black  
Philip A. Blair  
Stanley E. Blinkhorn  
Roy H. Carlson  
John H. Collamer  
Leonard E. DeBrie  
Walter P. Doolittle

★ ★ ★ ★

Graduating Class, 1959, College of Veterinary Medicine, Colorado State University



## Graduating Class, 1939, College of Veterinary Medicine, University of Illinois



Top row (left to right)—Gerald W. Kleckler, Harold Glen Meiner, Dale M. Bennett, Marion D. Blier, Donald L. Singletary, James V. Scott, Maynard O. Engstrom.

Second row—Glen D. Calhoun, Robert M. Mack, Dean Carl A. Brandly, Robert G. Williams, Jack D. Noyes.

Third row—Robert J. Young, Dwight G. Bennett, Jr., Wesley J. Zehr, Marvin T. Case, Daniel William Schamper, Russell L. Schnepfer, Philip Zand.

Fourth row—Donald L. Houston, Roger A. Litz, Robert S. Blakely, Robert A. Price, William E. Britz, Jr., Beryl D. Mell, Melvin G. Dewey.

**University of Illinois.**—At the 1939 commencement exercises of the College of Veterinary Medicine, University of Illinois, the following 25 candidates were presented for the D.V.M. degree:

Dale Milton Bennett  
Dwight G. Bennett, Jr.  
Robert Stevens Blakely  
Marion David Blier  
William Edward Britz, Jr.  
Glen David Calhoun  
Marvin Theodore Case  
Melvin George Dewey  
Maynard Oscar Engstrom  
Donald Louis Houston  
Gerald Wayne Kleckler  
Roger Anthony Litz

Robert Marvin Mack  
Harold Glen Meiner  
Beryl David Mell  
Jack Dornier Noyes  
Robert Allen Price  
Daniel William Schamper  
Russell Lee Schnepfer  
James Victor Scott  
Donald Lee Singletary  
Robert Gene Williams  
Robert Justin Young  
Philip Zand

Wesley Jay Zehr

**Iowa State College.**—At the 1939 commencement exercises of the Division of Veterinary Medicine, Iowa State College, the following 66 candidates were presented for the D.V.M. degree:

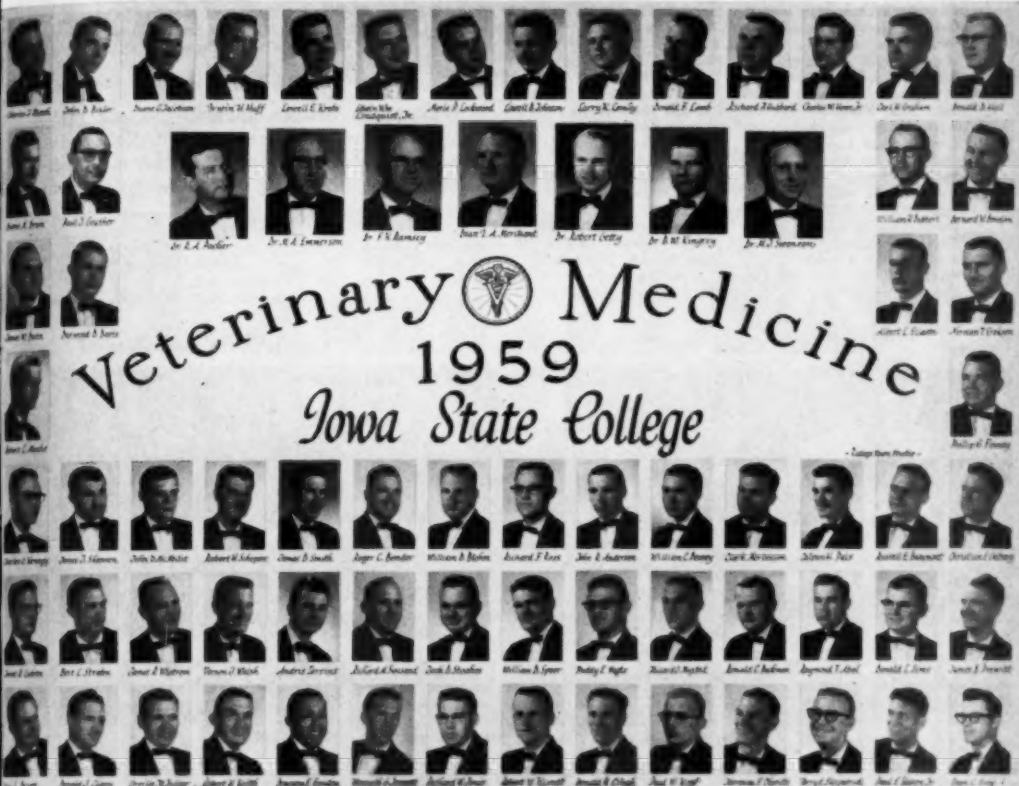
Raymond T. Abel  
John T. Anderson

Russell E. Beaumont  
Ronald C. Beckman

Roger C. Bender  
Paul E. Bessire, Jr.  
John D. Bixler  
Charles J. Blank  
William D. Blohm  
Donald J. Casey  
Norman F. Chevillie  
Donald R. Cihak  
Durwood D. Davis  
Bernard W. Donelahn  
Dale L. Drum  
Duane M. Drum  
William H. Dubbert  
James W. Dunn  
Albert L. Eliason  
Norman T. Erikson  
Philip G. Finney  
Terry E. Fitzpatrick  
Dean C. Frey  
Paul J. Geuther  
Donovan E. Gordon  
Carl H. Graham  
Donald D. Hall  
Charles W. Howe, Jr.  
Richard A. Hubbard  
Irwin H. Huff  
Duane G. Jacobson  
Kenneth G. Jennett  
Lowell B. Johnson  
Richard W. Jones  
Orville M. Juhler

Robert H. Keith  
C. Oliver Kenagy  
Robert W. Klindt  
Paul W. Kopf  
Lowell E. Krebs  
Donald F. Lamb  
Larry K. Lemley  
Edwin W. Linquist, Jr.  
Merle P. Lockwood  
James R. Luksen  
John O. McNellis  
Robert L. Maahs  
Millard J. Maxted  
Clark Mortenson  
Christian E. Oelberg  
Calvin H. Pals  
William C. Pewsey  
James D. Prewitt  
Richard F. Ross  
Robert H. Schepers  
James J. Shannon  
Donald L. Sime  
James D. Smith  
William D. Speer  
Jack D. Stokas  
Bert L. Strahn  
Richard M. Swasand  
Buddy E. Vagts  
Vernon J. Walsh  
James R. Wistrom  
Andris Zervins

Graduating Class, 1959, Division of Veterinary Medicine, Iowa State College



Top row (left to right)—Charles J. Blank, John D. Bixler, Duane C. Jacobson, Irwin H. Huff, Lowell E. Krebs, Edwin W. Lindquist, Jr., Merle P. Lockwood, Lowell B. Johnson, Larry K. Lemley, Donald F. Lamb, Richard A. Hubbard, Charles W. Howe, Jr., Carl H. Graham, Donald D. Hall.

Second row—Duane M. Drum, Paul J. Geuther, Dr. R. A. Packer, Dr. M. A. Emmerson, Dr. F. K. Ramsey, Dean I. A. Merchant, Dr. Robert Getty, Dr. B. W. Kingrey, Dr. M. J. Swenson, William H. Dubbert, Bernard W. Donelan.

Third row—James W. Dunn, Durwood D. Davis, Albert L. Eliassen, Norman T. Erekson.

Fourth row—Robert L. Maahs, Phillip G. Finney.

Fifth row—Charles O. Kenagy, James L. Shannon, John O. McNellis, Robert H. Schepers, James D. Smith, Roger C. Bender, William D. Blohm, Richard R. Ross, John R. Anderson, William C. Pewsey, Clark Mortenson, Calvan H. Pals, Russell E. Beaumont, Christian E. Oelberg.

Sixth row—James R. Lubsen, Bert L. Strahn, James R. Wistrom, Vernon J. Walsh, Andris Zervins, Richard M. Swasand, Jack D. Stoakes, William D. Speer, Buddy E. Vagts, Millard J. Maxted, Ronald C. Beckman, Raymond T. Abel, Donald L. Sime, James D. Prewitt.

Seventh row—Dale L. Drum, Donald J. Casey, Orville M. Juhler, Robert H. Keith, Donovan E. Gordon, Kenneth G. Jennett, Richard W. Jones, Robert W. Klindt, Donald R. Cihak, Paul W. Kopf, Norman F. Chevillie, Terry E. Fitzpatrick, Paul E. Bessire, Jr., Dean C. Frey.

• • •

**Kansas State University.**—At the 1959 commencement exercises of the School of Veterinary Medicine, Kansas State University, the following 70 candidates were presented for the D.V.M. degree:

Franklin Alfred Ahrens  
Dwyer Dallas Albert

Hiram Antonio Amundaray  
Earl Dayton Binford

John Clifford Breithaupt  
Joseph Micheal Brennan  
James West Carlson  
David Loren Carnahan  
Lowell Dean Cornwell  
Roy Merl Craig  
Ronald Neilson Dale  
Paul Martin Daniels  
Clement Carlyle Darrow, II

Robert William Disney  
Alvin John Edwards  
Howard Hugh Erickson  
David Fred Erwin, Jr.  
John William Forsberg  
John Thomas Gangel  
John Phillips Gibson  
Samuel Lyon Graham  
John Edward Gruber

Richard Leslie Hackler  
George Barnett Henry, Jr.  
Dale Ruehlen Hodgson  
George Kimbal Hoover  
Donald Ray Impson  
Harry Joyner Jefferson  
Edward Schreiber John  
William Fred Kelsey  
Paul Alan Kiger  
Alvin Aden Lidolph  
Louis Arthur Lumpkin  
Duane Lavon Mach  
Boyd C. Martin  
John Robert Matson  
Curtis Leroy McCauley  
David Ezra McClun  
Edward Timothy McKenna  
Ernest Alvin Money  
Norman Rose Morrow  
Orval Thomas Needles

Bradley Phillip Neer  
William Wayne Neer  
Kem R. Nevitt  
Roy Nielson, Jr.  
Billy Pat Patton  
Ronald Charles Poppy  
Gary N. Pottorff  
Elmer Rudolph Reich  
Richard Dean Royse  
Jimmie Frank Rusher  
Robert Wallis Russum  
Jerry Joe Schafer  
Robert Eugene Schuster  
James Herman Smart  
Ray Edwin Steinbach  
Andrew James Stewart  
Samuel Edward Strahm  
Gary Eugene Troutman  
Samuel Merritt Tyson  
William Ernest Upchurch

Richard William Voelker,  
Jr.  
Billy Kenneth Walker  
Charles Ledger Wilson  
Bernard Charles Zecha

Donald Eugene Wittum  
Ronald Joe Woitalewicz  
Lloyd Marion Wright  
John Charles Yatsook

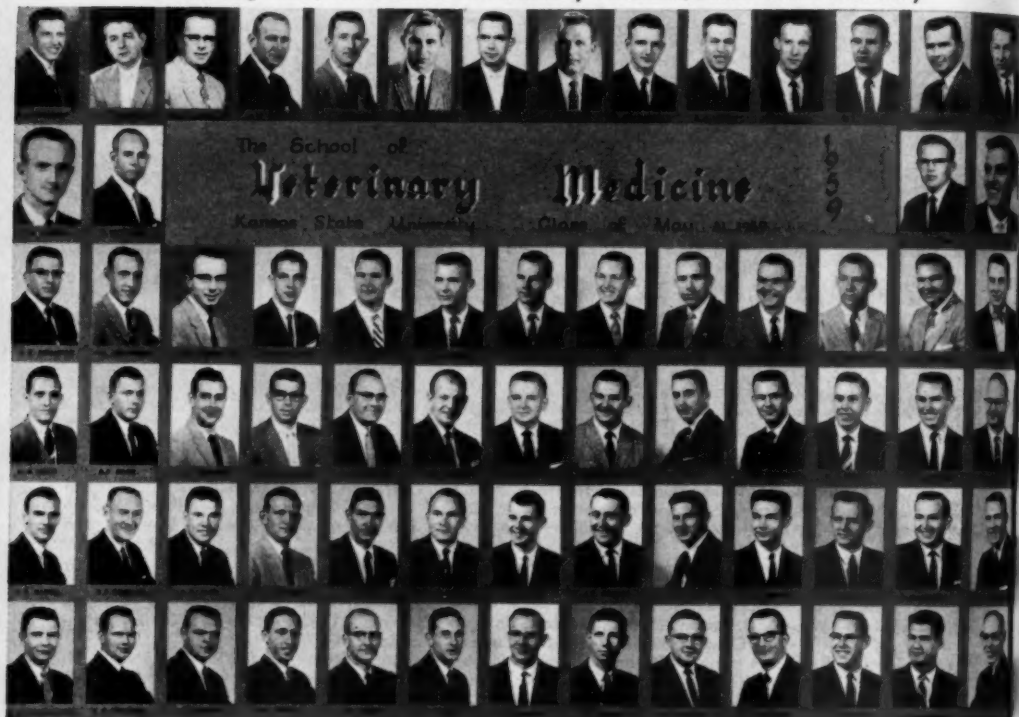
• • •

**Washington State College.**—At the 1959 commencement exercises of the College of Veterinary Medicine, State College of Washington, the following 41 candidates were presented for the D.V.M. degree:

Charles J. Barth  
Berge G. Berg

Robert S. Carkeek  
Royal Thair Carver

### Graduating Class, 1959, School of Veterinary Medicine, Kansas State University



Top row (left to right)—A. J. Stewart, O. T. Needles, C. L. McCauley, R. M. Craig, W. E. Upchurch, J. C. Breithaupt, E. T. McKenna, B. C. Zecha, P. M. Daniels, R. D. Royse, R. W. Disney, R. L. Hackler, R. N. Dale, J. F. Rusher.

Second row—F. A. Ahrens, S. M. Tyson, D. E. Wittum, J. R. Matson.

Third row—R. E. Schuster, H. J. Jefferson, G. B. Henry, Jr., J. M. Brennan, R. E. Steinbach, J. W. Carlson, S. L. Graham, J. H. Smart, E. A. Money, D. L. Carnahan, R. W. Voelker, Jr., B. K. Walker, C. L. Wilson.

Fourth row—W. W. Neer, B. P. Neer, E. D. Binford, R. W. Russum, A. A. Lidolph, J. W. Forsberg, R. C. Poppy, D. E. McClun, D. L. Mach, N. R. Morrow, K. R. Nevitt, B. P. Patton, B. C. Martin.

Fifth row—J. T. Gangel, D. F. Erwin, Jr., E. S. John, D. R. Hodgson, P. A. Kiger, L. A. Lumpkin, C. C. Derrow, II, J. E. Gruber, L. D. Cornwell, G. K. Hoover, Roy Nielson, Jr., D. R. Impson, W. F. Kelsey.

Sixth row—R. J. Woitalewicz, G. E. Troutman, S. E. Strahm, E. R. Reich, L. M. Wright, J. P. Gibson, A. J. Edwards, H. H. Erickson, J. C. Yatsook, J. J. Schafer, G. N. Pottorff, H. A. Amundaray, D. D. Albert.

Richard Chesterfield  
Nedon R. Christensen  
Robert Warren Compton  
Perry S. Dahlquist  
Lee Scheib Erickson  
James M. Ferrell  
John Wesley Frazer  
Charles A. Garrett  
Max L. Glasgow

Robert William Goodwin  
Charles Ebenezer Hunt  
Roger Claude Jones  
Mark Chenaunt Keyes  
June Marie Konz  
Charles Cleave Kruger  
V. Glade Leavitt  
Tate Matsuoka  
Charles Arnold Mayer

Charles L. Wright

Kenneth L. McGough  
Lynn B. McKinney  
Duncan John McLean  
Robert M. Nakamura  
Conrad Odin Orr, Jr.  
George W. Passmore  
William Dale Prichard  
Harvey Albert Ragan  
Birger Sather

Michael A. Stedham  
Allen Lyle Stout  
Robert Sigurd Syvrud  
Owen L. Thompson  
Dale A. Tibbitts  
Randolph C. Valentine  
Howard C. Wagner  
Richard Wagner  
Robert Williams

Graduating Class, 1959, College of Veterinary Medicine, State College of Washington



- Top row (left to right)—C. J. Barth, B. G. Berg, R. S. Carkeek, R. T. Carver, R. Chesterfield, N. R. Christensen, R. W. Compton.  
Second row—P. S. Dahlquist, L. S. Erickson, J. M. Ferrell, J. W. Frazer, C. A. Garrett, M. L. Glasgow, R. W. Goodwin.  
Third row—C. E. Hunt, R. C. Jones, M. C. Keyes, J. M. Konz, C. C. Kruger, V. G. Leavitt, T. Matsuoka.  
Fourth row—C. A. Mayer, K. L. McGough, L. B. McKinney, D. J. McLean, R. M. Nakamura, C. O. Orr, G. W. Passmore.  
Fifth row—W. D. Prichard, H. A. Ragan, B. Sather, M. A. Stedham, A. L. Stout, R. S. Syvrud, O. L. Thompson.  
Sixth row—D. A. Tibbitts, R. C. Valentine, H. C. Wagner, R. Wagner, R. Williams, C. L. Wright.



## DEATHS

Star indicates member of AVMA

**Harry L. Bussong** (KCV '18), 70, Belton, Mo., died May 1, 1959, at the Veterans Hospital there. He had practiced in Belton from 1919 to 1948, when he retired from practice due to ill health.

**Delbert R. Cook** (SF '18), 66, Ahwahnee, Calif., died on April 18, 1959. He had been in ill health for two years due to a heart condition.

After graduation, Dr. Cook began practice in Delano, where he remained until 1929. He then accepted a position with the state and moved to Los Angeles. Dr. Cook moved to Ahwahnee in 1957, when he retired.

**★Harry Hosafros** (CIN '14), 72, Carey, Ohio, died as the result of carcinoma, after a long illness, on April 18, 1959.

Dr. Hosafros served on the board of education of the Carey Exempted Village Schools for 16 years and was a village councilman for two terms. Beside the AVMA, Dr. Hosafros held memberships in three other veterinary associations.

**Marion C. Moses** (CVC '10), 75, New Carlisle, Ohio, died in Good Samaritan Hospital in Dayton, April 24, 1959, after an illness of three years.

Dr. Moses had retired from active practice in 1952, after 40 years of work in the field.

**★H. J. O'Connell** (MCK '18), 67, Madison, Wis., a veterinarian for the state and federal governments for more than 35 years, died in a Madison hospital on April 27, 1959, after a brief illness.

Dr. O'Connell joined the state's Department of Agriculture in 1924, and after many years as a field veterinarian, was named chief of the Department's animal disease division in February, 1951. Head of the tuberculosis eradication work practically since its inception, Dr. O'Connell was also in charge of the division when a campaign against brucellosis was launched in 1951.

At the time of Dr. O'Connell's retirement in January, 1957, Wisconsin was the first major dairy state to be declared certified brucellosis-free. After reaching the state's mandatory retirement age, Dr. O'Connell continued to head the tuberculosis control work, under federal appointment.

In 1957, the Wisconsin V.M.A. named Dr. O'Connell veterinarian of the year for his work in directing the expansion of the animal disease control program. Also in 1957, Dr. O'Connell received an award from the U.S.D.A.'s Agricultural Research Service for his work in Wisconsin's campaign against brucellosis. Dr. O'Connell was president of the Wisconsin V.M.A. in 1958.

**★Fred G. Ruder, Sr.** (UP '13), 68, Amherst, Mass., founder and first president of the Western Massachusetts Veterinary Association, died suddenly on May 3, 1959, following a heart attack.

Dr. Ruder had practiced in Amherst since his graduation from the University of Pennsylvania. He was an agent of the Division of Livestock Disease Control in Massachusetts, and for many years, served as inspector of animals and slaughtering.

Interested in community affairs, Dr. Ruder served on the Amherst School Board for three years. He was also active in the Boy Scouts of America and received a Silver Beaver Award for his work in the Hampshire-Franklin Council.

Dr. Ruder is an honorary member of the Massachusetts Veterinary Association, and the father of the Association's incumbent president, Dr. Fred G. Ruder, Jr. (UP '48).

**★James R. Sperry** (OSU '15), Colonel (Ret.), U.S. Army, 67, West Hyattsville, Md., died May 10, 1959, from a heart attack. Colonel Sperry retired from the Army Veterinary Corps in 1952. Since then, he has been teaching at the University of Maryland.

Beginning his Army career in 1917, Colonel Sperry served in Douglas, Ariz.; Hawaii; Chicago, Ill.; Fort Hamilton, N.Y.; Fort Reno, Okla.; Madison Barracks, N. Y.; Fort Myer, Va.; Fort Riley, Kan.; Fort Sam Houston, Texas; and Fort McPherson, Ga. During World War II, he served with the Third and Ninth Armies in Europe, and later was the Third U.S. Army veterinarian.

**★Jonas W. Trowbridge** (STJ '22), 70, Malden, Mo., died suddenly on May 1, 1959.

Dr. Trowbridge had practiced in Malden throughout the greater portion of his professional life and was still active in practice up until the time of his death.



**PARKE-DAVIS**

anticipates  
with  
pleasure  
another  
opportunity  
to greet  
*all*  
members  
attending the



Joint III  
PAN AMERICAN  
*Veterinary*  
CONGRESS

*and*

*96<sup>th</sup>*  
**A·V·M·A·**  
annual  
meeting

**KANSAS CITY • AUGUST 23-27**

**PARKE-DAVIS & COMPANY • DETROIT 32, MICH.**



when  
urinary  
tract  
infection  
is suspected

# FURADANTIN<sup>®</sup> ORA-BOLS<sup>™</sup>

brand of nitrofurantoin      **veterinary**

*new, exclusive veterinary dosage form*

*pleasant tasting • easily administered • readily retained*

*In small-animal urinary tract infections, FURADANTIN swiftly achieves high bactericidal concentrations in the urine, and in a high percentage of cases eliminates incontinence, dysuria, frequency, and straining. Of 32 dogs and cats recently treated,<sup>1</sup> 29 showed rapid clinical improvement. Often, there is marked improvement by the 4th day and complete recovery in 7 to 14 days.<sup>2</sup>*

*In canine tracheobronchitis, FURADANTIN given for 5 days stopped the coughing in 95% of 75 cases; in some dogs, complete symptomatic relief was gained in 48 hours.<sup>3</sup>*

#### COMPOSITION:

Each FURADANTIN ORA-BOLS provides FURADANTIN 50 mg. in an excipient containing dextrose. SUPPLIED:

Bottle of 100 scored 50 mg. ORA-BOLS. FURADANTIN also is available as: 10 mg. and 100 mg. scored tablets, bottles of 100, and Oral Suspension containing 5 mg. FURADANTIN per cc., bottle of 60 cc.

REFERENCES: 1. Mosier, J. E., and Coles, E. H.: Vet. Med. 53:649 (Dec.) 1958. 2. Belloff, G. B.: Calif. Vet. 9:27 (Sept.-Oct.) 1956. 3. Mosier, J. E.: Vet. Med. 52:445 (Sept.) 1957.

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NITROFURANS—a new class of antimicrobials—neither antibiotics nor sulfonamides  
ORA-BOLS<sup>™</sup> is the Eaton trade mark for small, bolus-shaped tablets.

EATON LABORATORIES, NORWICH, NEW YORK



## What Is Your Diagnosis?

Because of the interest in veterinary radiology, a case history and radiographs depicting a diagnostic problem are usually published in each issue.

**Make your diagnosis from the picture below—then turn the page ►**



Fig. 1 and 2—Medial (left) and dorsovascular (right) radiographs of the Collie's foot.

**History.**—A male Collie, 6 years old, was playing with another dog when he cried out and refused to walk on the right forelimb. The right carpal joint was enlarged somewhat but the owner said this was the result of an injury of five years' standing. At the time of the previous injury, the dog was lame and a small puncture wound was present on the dorsal surface of the carpus.

The wound was thought to be from a dog bite, and it healed promptly with home treatment. During the five years, the dog had shown no indication of discomfort, but the enlarged joint and "clumsy" gait persisted. Medial recumbent and dorsovascular radiographs were taken of the affected area (fig. 1 and 2).

## Here Is the Diagnosis

(Continued from preceding page)

**Diagnosis.**—Periostitis and exostosis of the distal end of the radius and arthritis of the carpal joint as the result of chronic inflammation due to a radiopaque object.



**Comment.**—Surgery revealed a .22-caliber bullet which was removed from the area of the distal extremity of the radius. This was thought to have been responsible for the local periostitis and exostosis as well as the arthritis and calcium deposits in the carpal joint capsule.

Eight months after surgery, the dog used the leg normally except for a slight limp early in the morning in damp weather. The limp disappeared after the dog used the leg for about an hour.

**Fig. 3**—Medial view of the Collie's foot showing (a) periostitis, (b) exostosis, (c) arthritis and calcium deposits of the carpal joints.

This report was submitted by Drs. Harold Kopp and Nell Stockton, Greenwich, Conn.

Our readers are invited to submit histories, radiographs, and diagnoses of interesting cases which are suitable for publication.





*Outstanding effectiveness in the routine treatment of* **CANINE DIARRHEA**

# **FURADEX<sup>®</sup> ORA-BOLS<sup>™</sup>** *veterinary*

***Complete remissions in 37 of 38 dogs<sup>1</sup>*** FURADEX

"... shortened the duration of diarrhea in comparison with previously used drugs, and in most cases produced an apparent complete recovery ... (The diarrhea) generally ceased in 2 to 7 days without any side effect due to medication."<sup>2</sup>

Containing FURACIN<sup>®</sup> (brand of nitrofurazone) in an excipient of dextrose for peroral therapy, FURADEX is achieving striking results in bacterial and nonspecific diarrheas and in diarrheas associated with other diseases such as distemper and hepatitis. FURADEX has the advantage of being highly palatable to dogs, which facilitates treatment,<sup>1,2</sup> and is a point of superiority over other preparations.



SUPPLIED: 50 mg. scored ORA-BOLS, bottle of 100.

REFERENCES: 1. Pollock, S.: Control of Nonspecific and Specific Enteritis in the Dog; read at the First Regional Conference on the Nitrofurans in Veterinary Medicine, Wilmington, Delaware (June 5, 1958). 2. Fisher, G. W.: Oral Use of Furdex in Canine Diarrhea, N. A. Vet. 39:133-134 (Mar. 15) 1958.

ORA-BOLS<sup>™</sup> is the Eaton trade mark for small bolus-shaped tablets.  
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NITROFURANS ... a new class of antimicrobials ... neither antibiotics nor sulfonamides  
EATON LABORATORIES, NORWICH, NEW YORK



## Joint AVMA-Pan American Meeting Kansas City, August 24-27

### Convention States' Agriculture

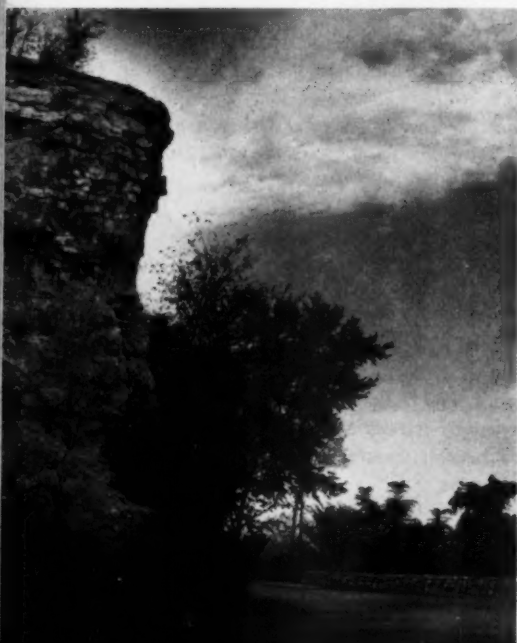
■ Called "Mother of the West" because so many of her native and adopted sons contributed toward the opening of the plains and mountain territories for settlement, Missouri continues to earn the title in her ability to feed our family of states.

Missouri ranks fifth in the nation's beef cattle population, and sixth in numbers of cattle of all types. Her sister state of Kansas ranks fourth in both types of cattle. Missouri and Kansas are

fourteenth and fifteenth respectively in numbers of sheep, and Missouri is fourth among the swine-raising states.

The stockyards at St. Louis and Kansas City are among the busiest of the nation, vying with Chicago for the title of "World's Largest."

In both states, livestock is the single most important source of farm income. Livestock and livestock products earned \$659,950,000 for Missouri



Commercial Livestock Slaughter, January to August, 1959\*

	Missouri	Kansas	Total U.S.
<b>CATTLE</b>			
Jan.-Aug.	638,000	611,500	15,684,000
Aug.**	80,500	76,000	
<b>CALVES</b>			
Jan.-Aug.	74,200	55,000	6,224,700
Aug.**	8,100	7,600	
<b>HOGS</b>			
Jan.-Aug.	2,121,000	1,474,000	44,668,600
Aug.**	259,000	185,000	
<b>SHEEP and LAMBS</b>			
Jan.-Aug.	285,500	249,800	9,414,200
Aug.**	27,500	19,800	

\*U.S.D.A. Agricultural Marketing Service, September, 1959

\*\*Peak Month

farmers, compared to \$373,053,000 from crops. In Kansas, livestock accounted for \$495,266,000 while crops were responsible for \$381,462,000 of farm income.

Cliff Drive, an important segment of the boulevard and park system, overlooks a vast industrial area bordering the Missouri River.

►  
An example of terrace farming being done by the farmers of Missouri and Kansas.



Fifty million acres on 120,167 farms were being worked in Kansas, according to a 1954 census. In Missouri, 34 million acres were cultivated, with the acreage divided among 201,614 farms.

Corn, hay, soybeans, cotton, and cotton seed are the principal crops of Missouri's river bottoms and Ozark foothills. Kansas' plains produce one-fifth of the nation's winter wheat supply. Other major crops include corn, alfalfa, potatoes, fruits, barley, oats, grain, sorghum, and flax.

For a profession principally engaged with agriculture, Missouri and Kansas offer many scenes of interest.

Kansas City is the home of the Midwest Feed Manufacturer's Association, the American Poultry and Hatchery Federation, the American Hereford Association, and the American Polled Hereford Association. Located at Kansas City are veterinary medical publications, the *Polled Hereford World Journal*, and the *Kansas Stockman*. It is also

the chosen site for the Agriculture Hall of Fame.

The American Angus Association headquarters is in St. Joseph, Mo., and the National Association of Artificial Breeders is in Columbia, Mo., where the veterinary school is located.

### Kansas City Housing

Hotel information, rates and reservation form will be found on adv. pages 49 and 50 of this issue, facing a location map for hotels and some other centrally located points of interest on adv. page 48.

Have You Made Your Reservation  
for the Pan American-AVMA  
Meeting?

▼ Kansas City's stockyards are known the world over. It is the nation's largest stock and feeder market. The large packing plants produce quality cuts.



## Meeting of the AVMA Council on Research

The Council on Research, meeting at the AVMA office in Chicago on March 22-23, 1959, received a report that the Executive Board had authorized \$30,000 for the 1959-1960 AVMA Fellowship Program. A solicitation program for the Research Fund probably will not be initiated until a ruling by the Internal Revenue Service which will indicate if monies involved are tax-exempt for both donor and recipient.

The Council's Goals and Means Committee reported that:

1) a brochure is being prepared which will emphasize the Council's program and philosophy and will describe the scholarly achievements and influence of graduate training and research on the profession,

2) Drs. T. C. Jones and C. H. Cunningham were designated to select the AVMA Science Youth Award winners at the National Science Fair at Hartford, Conn., May 6-9, 1959.

3) members of the Council will comprise a speakers bureau and upon request will appear before student and other groups to describe Council activities and other matters pertaining to research.

The 1959-1960 Fellowship Program approved by the Council includes 11 fellows, three of whom are renewals. Effective for the 1959-1960 program, the stipend was raised to a maximum of \$4,200 per year plus consideration of tuition and fees. The Council will send to the Executive Board a recommendation that the Bylaws be amended so as to make possible the awarding of these fellowships to students of veterinary medicine who have completed at least two years toward the D.V.M. degree but who are currently eligible for graduate study.

## APPLICATIONS

### Applicants Not Members of Constituent Associations

In accordance with paragraph (c) of Section 1, Article I, of the Bylaws, the names of applicants who are not members of constituent associations shall be published in the JOURNAL. Written comments received by the Executive Secretary from any active member regarding the application as published, will be furnished to the Judicial Council for its consideration prior to acceptance of the application.

#### GAUTAM, OM PARKASH

1068 River Rd. Dorm, Ohio State University, Columbus, Ohio. B.V.Sc. (Medalist), Punjab Veterinary College, 1951.

Vouchers: H. E. Amstutz and P. W. Murdick.

### Spanish Conversation

#### Habla Espanol?

Como le gusta la  
convencion?

How do you like  
the convention?

KO-mo lay GOOS-ta la  
kom-ben-see-OWN?

Se puede aprender  
mucho en una  
convencion.

One can learn a  
lot at a conven-  
tion.

Say PWAY-da a-pren-  
DAIR MOO-cho ayn  
OO-na kom-ben-see-  
OWN.

Donde esta su esposo?  
DON-day es-TA soo  
es-PO-so?

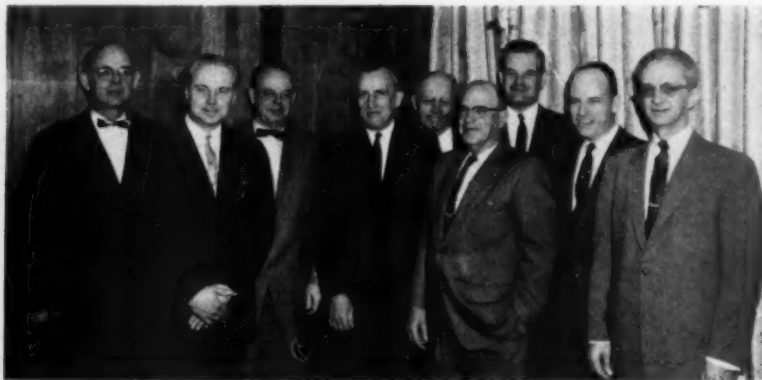
Where is your  
husband?

Esta en la sesion.  
Es-TA ayn la say-see-  
OWN.

He is at the meet-  
ing.

En que hotel esta Usted?  
En KAY o-TEL es-TA  
oo-STETH?

In which hotel are  
you staying?



AVMA Council on Research. From left to right: Drs. L. C. Ferguson, Robert Getty, W. A. Hagan, C. A. Brandly, Hadleigh Marsh, R. D. Turk, J. D. Wheat, T. C. Jones, and C. H. Cunningham.

for "uneventful"  
recovery from  
the conditions  
you see  
most often

infectious diarrhea, pre- and postoperative intestinal antisepsis:

▼  
**BIOSOL**\* *(neomycin sulfate)—resists absorption from the infection site . . .  
highly effective against the most common enteric pathogens.*

Available as liquid, soluble powder, sterile powder, tablet and bolus.

▼ **bovine mastitis:**

**SPECIAL FORMULA NO. 17900**\*

*(hydrocortisone acetate, neomycin sulfate, procaine penicillin G, polymyxin B sulfate)*

*broad antibacterial action . . . effective anti-inflammatory action.*

Packaged in disposable Xpresit\* for easy administration.

▼ **equine gastrointestinal parasites:**

**PARVEX**\* *(piperazine-carbon disulfide complex)—safe for horses of all ages . . .  
potent action to remove bots, large and small strongyles, ascarids and adult pinworms.*

Available as bolus or suspension.

▼ **acute or chronic infection with stress and inflammation:**

**BIO-DELTA**\* *(procaine penicillin G, dihydrostreptomycin, prednisolone)*

*fast-acting, potent glucocorticoid/anti-inflammatory agent.*

Available as a sterile aqueous suspension.

▼ **dermatitis, arthritis, bovine ketosis:**

**DELTA-CORTEF**\* *(prednisolone)*

*glucocorticoid potency in its most adaptable form.*

Available as a sterile aqueous suspension and tablets.

Check your dispensary now . . . it's time to restock these pharmaceuticals.

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Veterinary Division / THE UPJOHN COMPANY / Kalamazoo, Michigan



## WOMEN'S AUXILIARY

President—Mrs. E. A. Woelffer, 115 Woodland Lane,  
Oconomowoc, Wis.  
Secretary—Mrs. A. W. Eivers, 1745 S. 13th St., Salem, Ore.

### Recipients of 1959 Achievement Award from AVMA Women's Auxiliary

This is the 10th Anniversary of the Achievement Award offered by the Women's Auxiliary to the AVMA to a senior student of each accredited school of veterinary medicine in the United States and Canada who has contributed much to advance the standing of the veterinary profession and his school of veterinary medicine.

From 1949 to 1957, the award was a cash prize

of \$25 and a certificate, but in 1957, the cash prize was increased to \$50. Much credit goes to the affiliated auxiliaries for their generosity in contributions, thus enabling us to increase this amount.

Selection of the winners is left to the discretion of the veterinary schools. The record of each recipient indicates a quality of leadership and responsibility which will assure a successful career, and, by their individual accomplishments, contribute to the prestige and dignity of veterinary medicine.

We extend our sincere congratulations to each recipient and our very best wishes to them as they embark on their career as doctors of veterinary medicine.

S/(MRS. JAMES I.) ELIZABETH A. CORNWELL,  
*Acting Second Vice-President*



1) Robert D. Hawkins  
Alabama Polytechnic Institute

2) William H. Livingston  
Colorado State University

3) John E. Lowe  
Cornell University

4) Donald S. Fincher  
University of Georgia

5) William E. Britz, Jr.  
University of Illinois

6) William D. Speer  
Iowa State College

7) Samuel E. Strahm  
Kansas State College

8) Philip K. Wolfe  
Michigan State University

9) Robert R. Jorgensen  
University of Minnesota

10) Gene R. Shipley  
University of Missouri

11) Anicet R. Brault  
University of Montreal

12) Richard Roberts  
Ohio State University

13) Robert H. Gengler  
Oklahoma State University

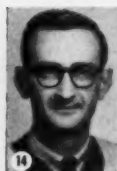
14) Raymond W. Giuliani  
University of Pennsylvania

15) Tommie A. Hennard, Jr.  
Texas A. & M. College

16) Reginald G. Thomson  
University of Toronto

17) Mark C. Keyes  
Washington State College

Not pictured:  
Charles W. Jenner  
University of California



TO: ALL VETERINARIANS

SUBJECT:

# Elfaro-Dex

**INDICATIONS:** An iron dextran injectable for the prevention of anemia in newly-farrowed pigs.

**ADMINISTRATION:** Administer intramuscularly

**DOSAGE:** Single 2 cc. dose per baby pig, 1 to 4 days after farrowing.

**PACKAGING:** Elfaro-Dex is packaged in 10, 25, and 50 dose vials.

Elfaro-Dex is

# Research Laboratories'



new iron dextran injectable produced to overcome the lack of iron in newborn pigs. For pigs farrowed during any season, an Elfaro-Dex injection on the first to the fourth day keeps sucklings fully protected against anemia for the all-important first 4 weeks. The baby pig utilizes feed better, becomes more thrifty, steps-up weight gains, and is ready for market sooner. Resistance to scours, T.G.E., and other infections is greatly increased.

Elfaro-Dex is the time proved iron dextran injectable manufactured by Benger Laboratories, Ltd., Holmes Chapel, Cheshire, England. Only under the ethical label of Elfaro-Dex is this outstanding product offered exclusively to the veterinary profession.

Write for further information and free client literature.

Research Laboratories, Inc. St. Joseph, Missouri

Research Laboratories sells its products only to graduate veterinarians.



## COMING MEETINGS

Notices of coming meetings must be received 30 days before date of publication.

Alabama Polytechnic Institute. Fifty-second annual conference. School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, July 19-22, 1959. J. E. Greene, dean.

Virginia Veterinary Medical Association. Summer Convention. Hotel Chamberlin, Old Point Comfort, Fort Monroe, Va., July 19-21, 1959. G. B. Estes, 1308 East Franklin St., Richmond, Va., secretary.

Canadian Veterinary Medical Association. Annual convention. Ontario Veterinary College, Guelph, Ont., July 20-22, 1959. H. J. Neely, Ontario Veterinary College, Guelph, Ont., publicity committee chairman.

Nevada State Veterinary Association. Summer business meeting. Tonopah, Nev., July 25, 1959. B. L. Hutcherson, 2490 South Virginia, Reno, Nev., secretary.

Arkansas Veterinary Practitioner's Association. Annual meeting. Mather Lodge, Petit Jean State Park, Morrilton, Ark., July 26-28, 1959. W. H. Babbitt, 204 W. 13th St., North Little Rock, Ark., secretary-treasurer.

Mississippi State Veterinary Medical Association. Annual meeting. Buena Vista Hotel, Biloxi, Miss., July 26-29, 1959. J. W. Branson, P.O. Box 4223, Fondren Station, Jackson 6, secretary-treasurer.

American Association of Veterinary Bacteriologists. Annual meeting. Division of Veterinary Medicine, Iowa State College, Ames, Iowa, Aug. 22, 1959. C. H. Cunningham, Michigan State University, College of Veterinary Medicine, East Lansing, secretary.

Ninety-Sixth Annual Meeting, American Veterinary Medical Association, and Third Pan American Congress of Veterinary Medicine. Joint meeting. Kansas City, Mo., Aug. 23-27, 1959. H. E. Kingman, Jr., executive-secretary, AVMA, 600 S. Michigan Ave., Chicago 5, Ill. B. D. Blood, secretary-general, Directing Council, Pan American Congress of Veterinary Medicine, P.O. Box 99, Azul, F.C.N.G.R., Argentina, S.A.

Washington State Veterinary Medical Association. Annual meeting. Desert Inn, Richland, Aug. 31 to Sept. 1, 1959. Mr. Robert M. Ford, 2406 Boyer Ave., Seattle 2, Wash., executive secretary.

Colorado Veterinary Medical Association. Annual convention. Shirley Savoy Hotel, Denver, Colo., Sept. 3-4, 1959. Gail H. Gilbert, 5500 Wadsworth Ave., Arvada, executive secretary.

Electron Microscope Society of America. Seventeenth annual meeting. Ohio State University, Columbus, Sept. 9-12, 1959. Sydney S. Breese, Jr., Plum Island Animal Disease Laboratory, Greenport, L.I., N.Y., program chairman.

New York State Veterinary Medical Society. Annual meeting. Grossinger's, Grossinger, N.Y., Sept. 16-18, 1959. F. H. Fox, chairman.

New Mexico Veterinary Medical Association. Annual meeting. Western Skies Hotel, Albuquerque, N. M., Sept. 21-22, 1959. E. R. Leslie, 907 Alamosa, Carlsbad, N.M., secretary.

Eastern Iowa Veterinary Association, Inc. Forty-sixth annual meeting. Roosevelt Hotel, Cedar Rapids, Oct. 15-16, 1959. C. B. Thayer, Medical College, State University of Iowa, Iowa City, Iowa.

Interstate Veterinary Medical Association. Annual meeting. Sioux City, Iowa, Oct. 22-23, 1959. Dr. Don Rubel, 3209 38th St., Sioux City, secretary.

Animal Care Panel. Annual Convention. Sheraton Park Hotel, Washington, D.C., Oct. 29-31, 1959. William

I. Gay, Animal Care Panel, 2101 Constitution Ave., Washington 25, D.C., publicity committee chairman.

## Regularly Scheduled Meetings

ALABAMA—Central Alabama Veterinary Medical Association, the first Thursday of each month. James I. Chambers, 4307 Normanbridge Rd., Montgomery, Ala., secretary-treasurer.

Jefferson County Veterinary Medical Association, the second Thursday of each month. Dan P. Griswold, Jr., 714 S. 39th St., Birmingham, secretary.

Mobile-Baldwin Veterinary Medical Association, the third Tuesday of each month. Cecil S. Yarbrough, 4121 U.S. 90 West, Mobile, Ala., secretary.

North Alabama Veterinary Medical Association, the second Thursday of November, January, March, May, July, and September, in Decatur, Ala. Ray A. Ashwander, P.O. Box 1767, Decatur, Ala., secretary.

Northeast Alabama Veterinary Medical Association, the second Tuesday of every other month. Leonard J. Hill, P.O. Box 761, Gadsden, Ala., secretary-treasurer.

ALASKA—Anchorage Group of the Alaska V. M. A., the last Wednesday of each month at Fort Richardson Officers' Club or Thompson's Restaurant 6th and I Streets, Anchorage, Alaska. Lt. Colonel E. H. Akins, Surgeon's Office, U.S.A.R.A.L., Fort Richardson, Alaska, secretary to the Alaska V. M. A.

ARIZONA—Central Arizona Veterinary Medical Association, the second Tuesday of each month. J. W. Langley, Jr., P.O. Box 5013, Phoenix, Ariz., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. Gwyn Chapin, 2215 E. Calle Vista, Tucson, Ariz., secretary.

ARKANSAS—Pulaski County Veterinary Medical Society, the second Tuesday of each month. Harvie R. Ellis, 54 Belmont Drive, Little Rock, Ark., secretary-treasurer.

CALIFORNIA—Alameda-Contra Costa Veterinary Medical Association, the fourth Wednesday of Jan., March, May, June, Aug., Oct., and Nov. John S. Blackard, 420 Appian Way, Richmond, Calif., secretary.

Bay Counties Veterinary Medical Association, the second Tuesday of February, April, July, September, and December. Herb Warren, 3004 16th St., San Francisco, Calif., executive secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Paul S. Chaffee, 2333 McKinley Ave., Fresno, Calif., secretary.

Humboldt-Del Norte Counties Veterinary Medical Association, the second Tuesday of January, May, September, and November. Dr. C. A. Lamb, 2835 Dolbeer St., Eureka, Calif., secretary.

Kern County Veterinary Medical Association, the first Thursday evening of the month. James L. Frederickson, 17 Nile St., Bakersfield, Calif., secretary-treasurer.

Mid-Coast Veterinary Medical Association, the first Thursday of each month. William P. Matulich, P. O. Box 121, San Luis Obispo, Calif., secretary-treasurer.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. V. Todorovic, 47 Mann Ave., Watsonville, Calif., secretary.

Northern California Association of Veterinarians, the

second Tuesday of the month. Andrew F. Giambroni, P.O. Box 782, Red Bluff, Calif., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month at the Hotel Co-well, in Modesto, Calif. T. J. Carleton, 325 W. Lockeford St., Lodi, Calif., secretary-treasurer.

Orange Belt Veterinary Medical Association, the second Monday of each month. R. Y. Foos, P.O. Box 955, Victorville, Calif., secretary-treasurer.

Orange County Veterinary Medical Association, the third Thursday of each month. H. M. Stanton, 1122 S.E. U.S. Highway 101, Tustin, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of the month. R. M. Grandfield, 416 Stephens Rd., San Mateo, Calif., secretary-treasurer.

Redwood Empire Veterinary Medical Association, the third Thursday of the month. R. R. Rediske, 833 Vallejo Ave., Novato, Calif., secretary-treasurer.

Sacramento Valley Veterinary Medical Association, the second Wednesday of the month. E. C. Story, 4819 "V" St., Sacramento 17, Calif., secretary-treasurer.

San Diego County Veterinary Medical Association, the fourth Tuesday of the month. Robert F. Burns, 7572 North Ave., Lemon Grove, Calif., secretary-treasurer.

San Fernando Valley Chapter SCVMA, the second Tuesday of each month at 7:30 p.m., Hody's Restaurant, North Hollywood, Calif. Barbara G. Shirley, Canoga Park, Calif., secretary-treasurer.

San Fernando Valley Veterinary Medical Association, the second Friday of each month at the Casa Escobar Restaurant in Studio City. John Chudacoff, 7912 Sepulveda Blvd., Van Nuys, Calif., secretary.

Santa Barbara-Ventura Counties Veterinary Medical Association, every three months, no set date. Gerald M. Clark, 5415 8th St., Carpinteria, Calif., secretary-treasurer.

Santa Clara Valley Veterinary Medical Association, the last Tuesday of the month. Robert L. King, 1269 Grant St., Santa Clara, Calif., secretary-treasurer.

Southern California Veterinary Medical Association, the third Wednesday of the month. Mr. Don Mahan, 1919 Wilshire Blvd., Los Angeles 57, Calif., executive secretary.

**COLORADO**—Denver Area Veterinary Medical Society, the fourth Tuesday of every month. Gene M. Bierhaus, 2896 S. Federal Blvd., Englewood, Colo., secretary-treasurer.

Northern Colorado Veterinary Medical Society, the first Wednesday of each month, in Fort Collins. Dr. James Voss, Veterinary Hospital, Colorado State University, Fort Collins, Colo., secretary.

**DELAWARE**—New Castle County Veterinary Medical Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. A. P. Mayer, Jr., R.F.D. 2, Newark, Del., secretary-treasurer.

**DISTRICT OF COLUMBIA**—District of Columbia Veterinary Medical Association, the second Tuesday evenings of January, March, May, and October. R. B. Goehenour, 18109 Ashwood Dr., Kensington, Md., secretary-treasurer.

**FLORIDA**—Big Bend Veterinary Medical Association, meets the first Sunday of each month at 5:00 p. m., at the Tallahassee Dining Room, Tallahassee. C. Paul Vickers, P.O. Box 309, Tallahassee, secretary.

Central Florida Veterinary Medical Association, the first Friday of each month at 8:00 p. m., place specified monthly. L. R. Poe, 753 W. Fairbanks Ave., Winter Park, Fla., secretary-treasurer.

Florida West Coast Veterinary Medical Association, the second Wednesday of each month at the Lighthouse Inn, St. Petersburg. Fred Jones, 3606 S. Dale Mabry, Tampa, Fla., secretary.

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## History of the AVMA



Seal of the United States Veterinary Medical Association, adopted in 1863.

That the original constitution of the United States Veterinary Medical Association proved to be workable is indicated by the fact that relatively few changes in the organization were required for a considerable time. As originally constituted, the Association was governed by a Board of Censors and a *Comitia Minora*, corresponding more or less to the present Board of Governors and the Executive Board respectively. The *Comitia Minora* consisted of the officers and the Board of Censors.

Elected as censors at the organization meeting were: A. Large, a London graduate, and later president; E. T. Thayer, M.D., V.S., later president; Jacob Dilts of New Jersey, a graduate of the Boston Veterinary Institute; and J. C. Essenwein and E. H. Palmer of Pennsylvania, both nongraduates. The death of Dr. Palmer in 1864 was the first among the original group. Alexandre Liautard, the hardest of the founders, died in 1918.

The original constitution called for an annual meeting in September and a semiannual meeting in March. The semiannual sessions were discontinued after a period of 25 years. During this time, it was customary to hold the annual meeting in New York and the semiannual convention in Boston. With a majority of the veterinary population centered in New England and the Middle Atlantic states, this arrangement was at least convenient, and it served the interests of the greatest number of veterinarians.

Later, as the population spread westward, veterinarians west of the Alleghenies tended to feel that the U.S.V.M.A. was an "eastern" association which did not represent them adequately. Recognizing this, the Association held its annual meeting in 1884 at Cincinnati, and at Chicago in 1890, after which the meeting site was shifted in much the manner it is at present.

In reviewing the meetings during successive years, no distinction will be made between events which transpired at the annual and semiannual meetings; for many years the

faithful few attended both, and in effect were the Association.

Although the membership remained fairly static for some time—there appears to have been a net gain of only one member during the first ten years—there was no lack of interest on the part of those who attended the meetings. Both of the meetings for 1864 were held in New York. Papers were presented by A. S. Copeman on "The Composition of the Tissues of Animals;" by G. W. Bowler on "Rabies;" by Robert Jennings on "Suppression of Urine in Horses;" and by C. M. Wood on "The Status of Veterinary Medicine." Committees on Education, Finance, Library, and Diseases were appointed. Election of officers resulted in the choice of A. S. Copeman, president; R. Jennings, secretary; and C. M. Wood, treasurer.

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JOSIAH H. STICKNEY, M.D., M.R.C.V.S., first president of the U.S.V.M.A., was born in Boston in 1827. Before going to London for veterinary training, he had obtained the M.D. degree in Boston. At the time, it was unusual for a physician to study veterinary medicine; later the reverse became fairly common.

Dr. Stickney was characterized by his colleagues as "a clever, highly-educated, thorough diagnostician . . . always ready for a scientific discussion, a consultation, or a doubtful diagnosis to settle."

Concerning his personal attributes, a friend of 40 years states: "He was modest and yet forceful, unassuming and yet confident, generous and self-sacrificing beyond measure."

Dr. Stickney appears to have been elected as the first president more or less as a token of the esteem in which he was held by his fellow practitioners. He was also a member of the Committee on Organization which drafted the Constitution, and after his tenure as president, held an elective office for 17 consecutive years.

Although he did not write for the veterinary journals, he lectured on veterinary science at the Massachusetts Agricultural College. He was faithful in his attendance at Association meetings, and was one of the three remaining founders present to see the second quarter-century ushered in.

At the following meeting in 1889—the last he was to attend—he responded to the recognition of his long service with a toast to "the early days of the Association."

Shortly before he died in 1902, a few days less than 75 years of age, he remarked—apparently thinking of his own illness, "Interesting cases come to us about the time we are ready to die."





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\*Beloff, G. B.: *Calif. Vet.* 9:16 (Nov.-Dec.) 1966.

Hillsborough County Veterinary Medical Society, the second Monday evening of each month. For additional information as to the location of each meeting, contact: J. J. Metz, Jr., 5207 Nebraska Ave., Tampa 3, Fla., secretary.

Jacksonville Veterinary Medical Association, the first Thursday of every month. Dodson's Restaurant, Stephen C. Hite, 5807 105th St., Jacksonville 10, Fla., secretary.

Northwest Florida Veterinary Medical Society, third Wednesday of each month, time and place specified monthly. John Webb, P.O. Box 183, Cantonment, Fla., secretary-treasurer.

Palm Beach Veterinary Society, the last Thursday evening of each month. McArthur Dairy Building, Four Points, W. Palm Beach. B. W. Bigger, 2833 S. 4th St., Fort Pierce, Fla., secretary.

Ridge Veterinary Medical Association, the fourth Thursday of each month in Bartow, Fla. John S. Haromy, Route #1, Box 107-A, Lake Wales, Fla., secretary.

South Florida Veterinary Society, the third Wednesday of each month. Time and place specified monthly. Joe B. O'Quinn, 1690 E. 4th, Hialeah, Fla., secretary.

Suwannee Valley Veterinary Association, the fourth Tuesday of each month, Hotel Thomas, Gainesville. G. L. Burch, P.O. Box 403, Ocala, Fla., secretary-treasurer.

Volusia County Veterinary Medical Association, the fourth Thursday of each month. Robert E. Cope, 127 E. Mason, Daytona Beach, Fla., secretary.

GEORGIA—Atlanta Veterinary Medical Society, the third Thursday of each month at the Elk's Home, 726 Peachtree St., Atlanta. Clare L. Bromley, 634 Northside Dr., N.W., Atlanta, Ga., secretary.

Georgia-Carolina Veterinary Medical Association, the second Monday of each month at 8:00 p.m., at the Town

Tavern, Augusta, Ga. J. A. Schmitz, 1711 Gwinnett St., Augusta, Ga., secretary.

North Georgia Veterinary Medical Association, quarterly, no set date, the spring meeting at the Veterinary School, Athens, Ga. S. J. Shirley, Commerce, Ga., secretary.

Southeast Georgia Veterinary Medical Association, quarterly, date and meeting place varies. Hugh F. Arundel, P.O. Box 153, Statesboro, Ga., secretary.

South Georgia Veterinary Medical Association, the second Sunday of each quarter at 3:30 p.m., at the Radium Springs Hotel, Albany, Ga. M. W. Hale, Route 2, Tifton, Ga., secretary.

ILLINOIS—Central Illinois Veterinary Medical Association, June 9, Sept. 9, and Dec. 10, 1959. Paul B. Doby, 4 Owens Lane, Springfield, secretary.

Chicago Veterinary Medical Association, the second Tuesday of each month, Charles H. Armstrong, 1021 Davis St., Evanston, secretary.

INDIANA—Calumet Area Veterinary Medical Association, the first Thursday of each month. Bruce Sharp, Box 166, Hobart, Ind., secretary-treasurer.

Central Indiana Veterinary Medical Association, the second Wednesday of each month. P. T. Parker, 224 N. Mill St., Plainfield, Ind., secretary-treasurer.

Michiana Veterinary Medical Association, the second Thursday of every month except July and December, at the Hotel LaSalle, South Bend, Ind. Stanton Williamson, 217 W. Chippewa St., South Bend, Ind., secretary.

Tenth District Veterinary Medical Association, the third Thursday of each month. J. S. Baker, P.O. Box 52, Pendleton, Ind., secretary.

IOWA—Cedar Valley Veterinary Medical Association, the second Monday of each month, except January, July, August, and October in Black's Tea Room, Waterloo,

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Iowa. A. J. Cotten, P.O. Box 183, Grundy Center, secretary.

Central Iowa Veterinary Medical Association, the third Monday of each month except June, July, and August at 6:30 p.m., Breeze House, Ankeny, Iowa. S. L. Hendricks, secretary-treasurer.

Central Iowa Veterinary Medical Association, the third Monday of each month, except June, July, and August, at 6:30 p.m., Breeze House, Ankeny, Iowa. John Herrick, 202 S. Hazel Ave., Ames, secretary.

Coon Valley Veterinary Medical Association, the second Wednesday of each month, September through May, at 7:30 p.m., Cobblestone Inn, Storm Lake, Iowa. Robert McCutcheon, Holstein, secretary.

East Central Iowa Veterinary Medical Society, the Second Thursday of each month at 6:30 p.m., usually in Cedar Rapids, Iowa. T. F. Bartley, P.O. Box 454, Cedar Rapids, secretary.

Fayette County Veterinary Medical Association, the third Thursday of each month at 6:30 p.m. in West Union, Iowa. H. J. Morgan, West Union, secretary.

Lakes Veterinary Association, the first Tuesday of each month, September through May, at 6:30 p.m., at the Gardson Hotel, Estherville, Iowa. Barry Barnes, P.O. Box 162, Milford, secretary.

North Central Iowa Veterinary Medical Association, the third Thursday of April, at the Warden Hotel, Fort Dodge, Iowa. H. Engelbrecht, P. O. Box 797, Fort Dodge, secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wisneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northwest Iowa Veterinary Medical Association, the

second Tuesday of February, May, September, and December, at the Community Bldg., Sheldon. W. Ver Meer Hull, secretary.

Southeastern Iowa Veterinary Association, the first Tuesday of each month at Mt. Pleasant, Iowa. Warren Kilpatrick, Mediapolis, secretary.

Southwestern Iowa Veterinary Medical Association, the first Tuesday of April and October, Hotel Chieftain, Council Bluffs, Iowa. J. P. Stream, 202 S. Stone St., Creston, secretary.

Upper Iowa Veterinary Medical Association, the third Tuesday of each month at 7:00 p.m., at All Vets Center, Clear Lake, Iowa. W. A. Danker, Dows, Iowa, secretary.

**KENTUCKY**—Central Kentucky Veterinary Medical Association, the first Wednesday of each month. R. H. Folsom, P.O. Box 323, Danville, Ky., secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday of each month in Louisville or within a radius of 30 miles, except January, May, and July. G. R. Comfort, 2102 Reynolds Lane, Louisville, Ky., secretary-treasurer.

**LOUISIANA**—New Orleans Veterinary Medical Association, the third Thursday of every month at the Monteleone Hotel, New Orleans, at 8:30 p. m. Ronald C. Francis, 6421 Chef Menteur Highway, New Orleans, La., secretary-treasurer.

**MARYLAND**—Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m., at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Leonard D. Krinsky, 6111 Hartford Rd., Baltimore, Md., secretary.

**MICHIGAN**—Central Michigan Veterinary Medical Association, the first Wednesday of every month at 7 p.m. Jerry Fries, 2070 E. Main St., Owosso, Mich., secretary.

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Mid-State Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert W. Acron, 4110 Spring Rd., Jackson, Mich.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. Alvin R. Conquest, P.O. Box 514, Grand Blanc, Mich., secretary.

Southeastern Michigan Veterinary Medical Association, the fourth Wednesday of every month, September through May. Louis J. Rossoni, 24531 Princeton Ave., Dearborn 8, Mich., secretary.

MISSOURI—Greater St. Louis Veterinary Medical Association, the first Friday of each month (except July and August), at the Coronado Hotel, Lindell Blvd. and Spring Ave., St. Louis, Mo., at 8 p.m. Edwin E. Epstein, 4877 Natural Bridge Ave., St. Louis 15, Mo., secretary.

Kansas City Veterinary Medical Association and Kansas City Small Animal Hospital Association, the third Thursday of each month at the Hotel President, Kansas City, Mo. Robert E. Guilfoil, 18 N. 2nd St., Kansas City 18, Kan., secretary.

NEVADA—Western Nevada Veterinary Society, the first Tuesday of each month. Paul S. Silva, 1170 Airport Road, Reno, Nev., secretary.

NEW JERSEY—Central New Jersey Veterinary Medical Association, the second Thursday of November, January, March, and May at Old Hights Inn, Hightstown, N. J. David C. Tudor, R.D. 1, Box 284A, Cranbury, N. J., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April, except December, at the Irvington House, 925 Springfield Ave., Irvington, N.J. Bernard M. Weiner, 787 Clinton Ave., Newark, N.J., secretary.

Northern New Jersey Veterinary Association, the fourth

Tuesday of each month at the Elks Club, Hackensack. James R. Tanzola, Upper Saddle River, N.J., secretary.

Northwest Jersey Veterinary Society, the third Wednesday of every odd month. G. L. Smith, P.O. Box 938, Trenton, N.J., secretary.

South New Jersey Veterinary Medical Association, the fourth Tuesday of each month at the Collmont Diner, Collingswood, N.J. Marvin Rothman, 718 Dwight Ave., Collingswood, N.J., secretary.

NEW MEXICO—Bernalillo County Veterinary Practitioners Association, the third Wednesday of each month, Fex Club, Albuquerque. Donald W. Fitzgerald, 1825 Lomas Blvd., N.E., Albuquerque, N.M., secretary-treasurer.

NEW YORK—New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

Monroe County Veterinary Medical Association, the first Thursday of even-numbered months except August. Irwin Bircher, 50 University Ave., Rochester, N. Y., secretary.

NORTH CAROLINA—Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel, Greensboro. C. G. Sims, 2450 Battleground Ave., Greensboro, N. Car., secretary.

Eastern North Carolina Veterinary Medical Association, the last Tuesday evening of each month, time and place specified monthly. Byron H. Brow, Box 453, Goldsboro, N. Car., secretary-treasurer.

Piedmont Veterinary Medical Association, the last Friday of each month. J. G. Martin, Boone, N. Car., secretary.

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Rockingham, N. Car., at 7:30 p.m. J. E. Currie, 690 N. Leak St., Southern Pines, N. Car., secretary.

Western North Carolina Veterinary Medical Association, the second Thursday of every month at 7:00 p.m. in the George Vanderbilt Hotel, Asheville, N. Car. Viliu Lind, 346 State St., Marion, N. Car., secretary.

OHIO—Cincinnati Veterinary Medical Association, the third Tuesday of every month at Shuller's Wigwam, 6210 Hamilton Ave., at North Bend Road. G. C. Lewis, 451 E. Galbraith Rd., Cincinnati, Ohio, secretary-treasurer.

Columbus Academy of Veterinary Medicine, every month, September through May. E. M. Simonson, 3120 Valley View Dr., Columbus, Ohio, secretary-treasurer.

Cuyahoga County Veterinary Medical Association, the first Wednesday in September, October, December, February, March, April and May, at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. F. A. Coy, 8208 Carnegie Ave., Cleveland, Ohio, secretary.

Dayton Veterinary Medical Association, the third Tuesday of every month. O. W. Fallang, 6941 Far Hills Ave., Dayton, secretary.

Killbuck Valley Veterinary Medical Association, the first Wednesday of alternate months beginning with February. C. Gale, Wooster, Ohio, secretary-treasurer.

Mahoning County Veterinary Medical Association, the Fourth Tuesday of each month, at 9:00 p.m. Youngstown Maennerchor Club, Youngstown, Ohio. Sam Segall, 2935 Glenwood Ave., Youngstown, secretary.

Miami Valley Veterinary Medical Association, the first Wednesday of December, March, June, and September. J. M. Westfall, Greenville, Ohio, secretary-treasurer.

North Central Ohio Veterinary Medical Association, the

last Wednesday of each month except during the summer. R. W. McClung, Tiffin, Ohio, secretary-treasurer.

Northwestern Ohio Veterinary Medical Association, the last Wednesday of March and July. C. S. Alvanos, 1603 W. Bancroft St., Toledo, Ohio, secretary-treasurer.

Stark County Veterinary Medical Association, the second Tuesday of every month, at McBrides Emerald Lounge, Canton, Ohio. M. L. Willen, 4423 Tuscarawas St., Canton, Ohio, secretary.

Summit County Veterinary Medical Association, the last Tuesday of every month (except June, July, and August), at the Mayflower Hotel, Akron, Ohio. M. L. Scott, 42 W. Market St., Akron, Ohio, secretary-treasurer.

Tri-County Veterinary Medical Association, the fourth Wednesday of January, May, and September. Mrs. R. Slusher, Mason, Ohio, secretary-treasurer.

OKLAHOMA—Oklahoma County Veterinary Medical Association, the second Wednesday of every month, 7:30 p.m., Patrick's Foods Cafe, 1016 N.W. 23rd St., Oklahoma City. Claude A. Tigert, 3032 N.W. 68th St., Oklahoma City, Okla., secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month at the City-County Health Building, 4616 E. 15th St., Tulsa, Okla. Arlen D. Hill, 5302 E. 11th St., Tulsa, Okla., secretary.

Tulsa Association of Small Animal Veterinarians, first and third Mondays, City-County Health Dept. T. E. Messler, 3104 E. 51st St., Tulsa, Okla., secretary.

OREGON—Portland Veterinary Medical Association, the second Tuesday of each month, at 7:30 p.m. Ireland's Restaurant, Lloyds, 718 N.E. 12th Ave., Portland.

(Continued on adv. p. 46)

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Donald L. Moyer, 8415 S.E. McLoughlin Blvd., Portland 2, Ore., secretary.

Willamette Veterinary Medical Association, the third Tuesday of each month, except July and August, at the Marion Hotel, Salem. Robert J. Mallorie, P.O. Box 155, Silverton, Ore., secretary.

PENNSYLVANIA—Keystone Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania School of Veterinary Medicine. Raymond C. Snyder, N.E. Corner 47th St. and Hazel Ave., Philadelphia 43, Pa., secretary.

Lehigh Valley Veterinary Medical Association, the first Thursday of each month. Stewart Rockwell, 10th and Chestnut Sts., Emmaus, Pa., secretary.

Pennsylvania Northern Tier Veterinary Medical Association, the third Wednesday of each odd numbered month. R. L. Michel, Troy, Pa., secretary.

SOUTH CAROLINA—Piedmont Veterinary Medical Association, the third Wednesday of each month at the Fairforest Hotel, Union. S. Car. Worth Lanier, York, S. Car., secretary.

Georgia-Carolina Veterinary Medical Association—see GEORGIA.

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ANIMAL CLIPPER**

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Clip your animals the fast, easy way with the new Sunbeam Stewart electric Clipmaster animal clipper. Has quiet, powerful, air-cooled, ball-bearing motor inside the cool Easy-Grip handle. Anti-friction tension control assures perfect tension between blades, provides easy adjustment. No. 51, \$49.95, (Colorado & West, \$50.25).

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TEXAS—Coastal Bend Veterinary Association, the second Wednesday of each month. Jack E. Habluetzel, Route 1, Box 65-N, Ingleside, Texas, secretary.

Dallas County Veterinary Medical Association, the first Tuesday of each month at 7:30 p.m., at a place to be specified. Frank N. Black, 12830 Preston Rd., Dallas, Texas, corresponding secretary.

UTAH—Salt Lake Small Animal Hospital Association, the first Monday of every month, at the Holiday Inn, 3040 South State St., Salt Lake City, at 12:15 p. m. Douglas H. McKelvie, 1220 S. State St., Salt Lake City, Utah, secretary-treasurer.

VIRGINIA—Central Virginia Veterinary Association, the second Thursday of each month at 8:00 p. m., except July and August, at a place in Richmond to be announced monthly. Edwin M. Crawford, secretary-treasurer.

Northern Virginia Veterinary Conference Association, the second Tuesday of each month. T. P. Koudelka, P.O. Box 694, Harrisonburg, Va., secretary.

Northern Virginia Veterinary Society, the second Wednesday of every third month. Meeting place announced by letter. H. C. Newman, Box 145, Merrifield, secretary.

Southwestern Virginia Veterinary Medical Association, the first Thursday of each month. D. F. Watson, Blacksburg, secretary.

WASHINGTON—Seattle Veterinary Medical Association, the third Monday of each month, Magnolia American Legion Hall, 2870 32nd W., Seattle. Roy C. Tools, 10415 Main St., Bellevue, secretary.

South Puget Sound Veterinary Association, the second Thursday of each month except July and August. B. D. Benedictson, 3712 Plummer St., Olympia, Wash., secretary.

WEST VIRGINIA—Kyowva (Ky., Ohio, W. Va.) Veterinary Medical Association, the third Thursday of each month in the Hotel Pritchard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St., W. Huntington, W. Va., secretary.

WISCONSIN—Central Wisconsin Veterinary Medical Association, the second Tuesday of each quarter (March, June, Sept., Dec.) C. R. Carlson, 1109 E. LaSalle Ave., Barron, Wis., secretary.

Coulee Region Veterinary Medical Association, the third Wednesday of every other month. F. N. Petersen, Box 127, Cashton, Wis., secretary.

Dane County Veterinary Medical Association, the second Thursday of each month. Dr. E. P. Pope, 409 Farley Ave., Madison, Wis., secretary.

Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. Dr. Jordan Lewis, Menomonee Falls, Wis., secretary-treasurer.

Northeastern Wisconsin Veterinary Medical Association, the third Wednesday in April. William Madson, 218 E. Washington St., Appleton, Wis., secretary.

Rock Valley Veterinary Medical Association, the first Wednesday of each month. L. C. Allenstein, 209 S. Taft St., Whitewater, Wis., secretary.

Southeastern Veterinary Medical Association, the third Thursday of each month. John R. Curtis, 419 Cook St., Portage, Wis., secretary.

Wisconsin Valley Veterinary Medical Association, the second Tuesday of every other month. John B. Fleming, 209 E. 4th St., Marshfield, Wis., secretary.

### Dr. Gray Named Wyeth Vice-President

Dr. B. J. Gray (ISU '43), of Devon, Pa., has been named vice-president in charge of biological and pharmaceutical production for Wyeth Laboratories.

Dr. Gray was formerly president of Fort Dodge Laboratories, Inc. In 1954, he became the first veterinarian from the commercial field to be appointed by the AVMA to its Research Council as a member-at-large. He served for seven years as secretary-treasurer of the North Central Iowa V.M.A., and has been a member of the U.S. Livestock Sanitary Association.

Dr. Gray has been active in veterinary industry trade associations, as well as civic activities. In 1954, he was named Iowa's outstanding young man of the year by the Iowa Junior Chamber of Commerce.

### Beef Cattle Raising by Areas

In the past 20 years, since 1939, the beef-breeding cow population increased most (424%) in the 13 northeastern states; next most (336%) in 12 southeastern states, with the smallest increase (70%) in the 11 Rocky Mountain and western states. The greatest number of breeding cattle, 9,127,000, are still found in the six plains states, including those from North Dakota to Texas, but the 12 southeastern states with 5,820,000 now has more breeding cattle than has the 11 western states with 5,729,000.—*Successful Farm.* (Jan., 1959):36.

### Parke-Davis Honored for "Distinguished Advertising in the Public Interest"

An award for "distinguished advertising in the public interest" has been made to Parke, Davis & Company by *The Saturday Review*, a national weekly magazine.

The award was based on the pharmaceutical firm's 1958 advertising campaign which featured "this is what we work for at Parke-Davis . . . the better health and longer life that come with better medicines."

In addition to being one of only 27 companies honored with "distinguished advertising" awards, Parke-Davis also was singled out as one of 13 honored in the "public relations" category.

Approximately 300 advertising campaigns were screened by a committee of 24 judges, including leading educators, editors, publishers, research analysts, scholars, and advertising and public relations executives.

### Ten Human Diseases Decreased in 1957

The United States Office of Vital Statistics reported a decreased incidence for 1957 in brucellosis, diphtheria, encephalitis, hepatitis, malaria, poliomyelitis, psittacosis, trichinosis, tuberculosis, and typhoid fever. Increases were reported for amebiasis, some types of meningitis, and streptococcal infections.—*J.Am.M.A.* (Dec. 20, 1958): 28.


## helpful information

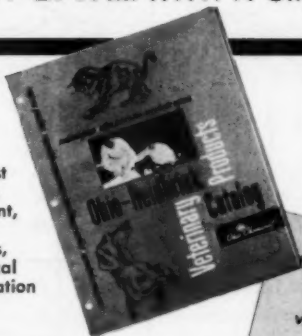
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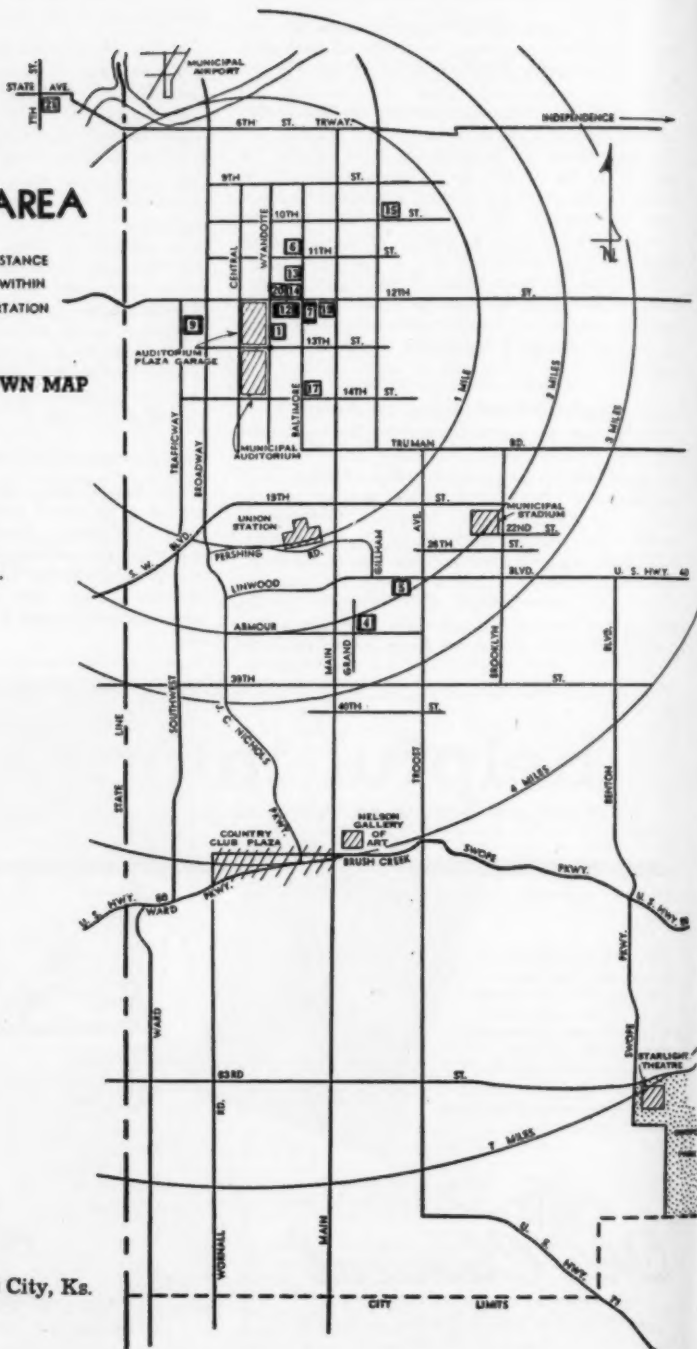
# Map of the GREATER KANSAS CITY AREA

ALL HOTELS NOT IN WALKING DISTANCE  
OF MUNICIPAL AUDITORIUM ARE WITHIN  
10 MINUTES BY PUBLIC TRANSPORTATION

## HOTEL LIST AND DOWNTOWN MAP

### NO. HOTEL

- 1 Aladdin,  
1213 Wyandotte
- 4 Bellerive,  
214 East Armour Blvd.
- 5 Berkshire,  
1021 E. Linwood
- 6 Continental,  
11th & Baltimore
- 7 Dixon,  
12th & Baltimore
- 9 Kansas Citian,  
1216 Broadway
- 12 Muehlebach,  
12th & Baltimore
- 13 New Yorker,  
1114 Baltimore
- 14 Phillips,  
12th & Baltimore
- 15 Pickwick,  
10th & McGee
- 17 President,  
14th & Baltimore
- 19 Senator,  
17 W. 12th St.
- 20 State,  
12th & Wyandotte
- 21 Town House,  
7th and State, Kansas City, Ka.





# HOTEL INFORMATION — KANSAS CITY, MO., CONVENTION

## Ninety-Sixth Annual AVMA Meeting, Aug. 23-27, 1959

All requests for hotel accommodations will be handled by a Housing Bureau in cooperation with the Committee on Local Arrangements. The Bureau will clear all requests and confirm reservations.

### Hotel and Rate Schedule

Map No.	Hotel	Single	Double	Twin	Suite
1.	Aladdin*	\$4.50-8.50	\$ 6.50-10.50	\$ 9.50-12.00	\$17.00-30.00
4.	Bellerive*	5.00-9.00	8.00-12.00	9.00-13.00	From \$18.00
5.	Berkshire*	5.00-7.00	7.00-10.00	8.50-10.00	From \$14.00
6.	Continental*	6.50-11.00	8.50-13.50	10.00-14.00	\$20.00-32.00
7.	Dixon	4.50-7.00	6.50-9.00	8.00-12.00	- - - - -
9.	Kansas Citian	3.50-8.00	5.50-11.00	7.00-14.00	From \$10.00
12.	Muehlebach*	Headquarters Hotel — No Room Accommodations			
13.	New Yorker	5.50-12.00	8.00-14.00	9.50-14.00	\$23.00
14.	Phillips*	7.50-10.50	9.50-13.00	11.50-14.00	\$20.50-35.00
15.	Pickwick*	5.85-10.85	6.35-10.85	8.35-12.50	From \$14.00
17.	President*	6.50-10.00	9.50-13.00	11.00-15.00	\$25.00
19.	Senator	3.50-7.00	5.00-10.00	6.00-10.00	\$15.00
20.	State	4.75-6.50	7.50-8.75	8.75-9.25	- - - - -
21.	Town House*	5.50-12.00	10.00-13.50	11.00-16.00	From \$23.00

\*100 per cent air-conditioned; in other hotels listed, majority of rooms air-conditioned.

**FAMILY PLAN**—The above hotels offer a "family plan" whereby children under 14 years of age will be accommodated in the same room with their parents at no extra charge. If more than one room is required to accommodate children, the hotel will charge only the single rate for each room.

**MOTELS**—Reservations for motels in the Kansas City area may be made through the Kansas City Convention and Visitors Bureau, 1030 Baltimore Ave., Third Floor, Kansas City 5, Missouri.

PLEASE USE APPLICATION ON REVERSE SIDE FOR HOTEL ACCOMMODATIONS

# Application for Hotel Accommodations

1959 AVMA Convention — Kansas City, Missouri

The Convention and Visitors Bureau will make every effort to place you according to your expressed wishes, or to best advantage elsewhere if that is not possible and you desire us to do so.

Please give us the complete information requested below. At least four choices of hotels, or more if you desire, are necessary. Arrange for double occupancy of rooms wherever possible; only a limited number of single rooms is available.

Date.....

Please make hotel reservation in accordance with the following:

Accommodations desired:

Hotel.....	First Choice
Hotel.....	Second Choice
Hotel.....	Third Choice
Hotel.....	Fourth Choice
.....Room WITH bath for one person	Rate per room desired \$..... to \$.....
.....Room WITH bath for two persons (double bed)	Rate per room desired \$..... to \$.....
.....Room WITH bath for two persons (twin beds)	Rate per room desired \$..... to \$.....
.....Large room WITH bath for..... persons	Rate per room desired \$..... to \$.....
.....Suite—Parlor, .....Bedroom(s) with bath for ..... persons.	Rate per suite desired \$.....

Arrival date....., hour..... A. M. .... P. M.

Departure date.....

If reservation cannot be made in one of the hotels indicated shall we place you elsewhere? Yes..... No.....

Please check your mode of transportation: Car..... Train..... Plane..... Bus.....

Rooms will be occupied by (NAMES OF ALL PARTIES MUST BE LISTED)  
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NAME	STREET ADDRESS	CITY	STATE

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**Cuts mixing time in half!** Liquid is absorbed almost instantly. And this meal stays moist. Won't pack down or cake in the feeding dish. Saves clean-up time too.

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Guests at a recent luncheon for food editors were each served two identical-looking pieces of steak. One was marked with a red skewer, the other with a yellow. They were asked which steak was tastier, and the vote was three to one in favor of the red-skewered meat.

Then it was revealed. The winning steaks came from steers injected with a new tranquilizer before embarking upon their three-day trip to the slaughtering pen. The yellow-tabbed steak was from steers that fidgeted and fussed their way through the ordeal.—*Medical Economics* (April 13, 1959): 54.

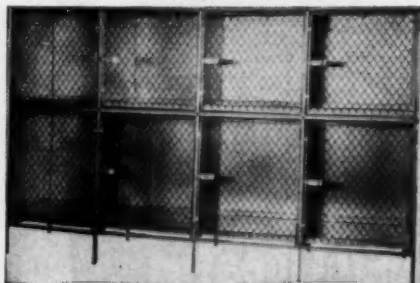
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*JOURNAL of the AVMA*

**Exclusive Publication.**—Articles submitted for publication are accepted with the understanding that they are not submitted to other journals, which is ethical publication procedure.

**Manuscripts.**—Manuscripts, including footnotes, references, and tables, must be typewritten, double-spaced, on 8½- by 11-in. bond paper, and the original and one carbon copy, submitted. One-inch margins should be allowed on the sides, with 2 in. at top and bottom. Articles should be concise. Short, simple sentences are clearer and more forceful than long, complex ones.

**Illustrations.**—Photographs should be furnished in glossy prints, and of a size that will fit into the JOURNAL of the American Veterinary Medical Association with a minimum of reduction. Photomicrographs which can not be reduced should be marked for cropping to 1-column or 2-column width. Identifying marks within the photomicrographs, such as arrows, letters, or numbers, should be clearly marked with black India ink or white opaque ink to insure good contrast for reproduction and must be large enough to stand reduction, if necessary.

Drawings, graphs, and charts should be made clearly and accurately in India ink on white paper and a glossy print of them submitted when possible. Numbers or letters appearing on graphs or charts should be large enough to allow for any reduction necessary for the chart or graph to fit JOURNAL pages. Blue lines in graph paper drop out in reproduction; therefore, if lines are required they must be drawn in black ink. All illustrations should bear the name of the author and the illustration number on the back.

**Tables.**—Tables should be simple and typed double space. Complex tables are not conducive to perusal. It is wiser to summarize complex material than to tabulate it.

**References.**—References should be typed double space, in alphabetical order, and should be prepared in the following style: name of author, title of article, name of periodical with volume, year, and page numbers. References to journals not commonly known should give the complete name of the periodical, and where published so that they may be added to our reference files. When books are cited, the name of publisher, location, edition, and year should be given.

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### DEADLINES

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15th of month issue — 20th of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the box number, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be sent to the advertiser.

### Wanted—Veterinarians

Veterinarian wanted as associate in large animal practice in central Alberta, Canada. Opportunity to take over practice in one to two years. Some real estate involved. Write giving full particulars of previous engagements, age, initial minimum salary expected, etc. Position open immediately. No provincial board examinations required in Alberta for graduates from Canadian, U.S., and British colleges. Address Box L 8, JOURNAL of the AVMA.

Veterinarian to manage small animal practice exclusively. Will be on own. Large Midwest town. Address Box L 9, JOURNAL of the AVMA.

Wanted—assistant veterinarian for small animal hospital in Chicago. Good opportunity. Address Box L 33, JOURNAL of the AVMA.

Wanted—assistant veterinarian for large animal practice in northern Illinois. Address Box L 34, JOURNAL of the AVMA.

Wanted—veterinarian for small animal hospital in the Chicago suburban area. Illinois license required. Address Box L 40, JOURNAL of the AVMA.

### UNIVERSITY OF SASKATCHEWAN VETERINARY SCIENCE DEPARTMENT ASSOCIATE PROFESSORSHIP—\$8500.

Applications are invited from veterinarians with postgraduate training in virology, preferably with a Ph.D., to carry out research work on virus diseases in domestic animals, poultry and wildlife. A limited amount of postgraduate teaching will be required. Moving allowance is provided. Address inquiries to Director, Veterinary Science Department, University of Saskatchewan, Saskatoon, Sask., Canada.

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Veterinarian desires position with small animal practitioner in Virginia. Would consider eventual partnership or purchase. Address Box L 2, JOURNAL of the AVMA.

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